

APR 21 1989

Woods Hole, Mass.

PROCEEDINGS
OF THE
CALIFORNIA ACADEMY OF SCIENCES

Vol. 45, No. 12, pp. 277-317, 8 figs.

December 7, 1988

THE MYRTLE FAMILY (MYRTACEAE) IN CHILE

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ABSTRACT: This paper is a floristic treatment of the Myrtle family (Myrtaceae) in Chile. The family is represented by nine genera and 26 species: *Amomyrtus* (2 spp.), *Blepharocalyx* (1 sp.), *Legrandia* (1 sp.), *Luma* (2 spp.), *Myrceugenia* (14 spp.), *Myrcianthes* (1 sp.), *Myrteola* (1 sp.), *Tepualia* (1 sp.), and *Ugni* (3 spp.). Keys to the genera and species are provided, as are descriptions, lists of synonyms, distribution maps, illustrations of most species, and notes on distribution, phenology, local names and uses, and similar or closely related taxa.

Received September 21, 1987. Accepted February 3, 1988.

NUMERICAL LIST OF TAXA

1. *Tepualia*
 - 1.1. *T. stipularis* Grisebach
2. *Myrcianthes*
 - 2.1. *M. coquimbensis* (Barnéoud) Landrum et Grifo
3. *Amomyrtus*
 - 3.1. *A. luma* (Molina) Legrand et Kausel
 - 3.2. *A. meli* (R. A. Philippi) Legrand et Kausel
4. *Blepharocalyx*
 - 4.1. *B. cruckshanksii* (W. J. Hooker et Arnott) Niedenzu
5. *Legrandia*
 - 5.1. *L. concinna* (R. A. Philippi) Kausel
6. *Myrteola*
 - 6.1. *M. nummularia* (Poiret) Berg
7. *Ugni*
 - 7.1. *U. candollei* (Barnéoud) Berg
 - 7.2. *U. molinae* Turczaninow
 - 7.3. *U. selkirkii* (W. J. Hooker et Arnott) Berg
8. *Myrceugenia*
 - 8.1. *M. chrysocarpa* (Berg) Kausel
 - 8.2. *M. colchaguensis* (R. A. Philippi) Navas
 - 8.3. *M. correifolia* (W. J. Hooker et Arnott) Berg
 - 8.4. *M. exsucca* (A. P. de Candolle) Berg
 - 8.5. *M. fernandeziana* (W. J. Hooker et Arnott) Johow
 - 8.6. *M. lanceolata* (Jussieu ex Jaume Saint-Hilaire) Kausel
 - 8.7. *M. leptospermoides* (A. P. de Candolle) Kausel
 - 8.8. *M. obtusa* (A. P. de Candolle) Berg
 - 8.9. *M. ovata* (W. J. Hooker et Arnott) Berg
 - 8.9a. var. *ovata*
 - 8.9b. var. *nannophylla* (Burret) Landrum

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- 8.10. *M. parvifolia* (A. P. de Candolle) Kausel
- 8.11. *M. pinifolia* (F. Philippi) Kausel
- 8.12. *M. planipes* (W. J. Hooker et Arnott) Berg
- 8.13. *M. rufa* (Colla) Skottsberg ex Kausel
- 8.14. *M. schulzei* Johow
9. *Luma*
 - 9.1. *L. apiculata* (A. P. de Candolle) Burret
 - 9.2. *L. chequen* (Molina) A. Gray

INTRODUCTION

The purpose of this paper is to present all the information necessary for the proper identification of Chilean Myrtaceae. Most of the genera have already been monographed (Landrum 1981, 1986, 1988) and monographs are being prepared for *Ugni* and *Amomyrtus*. However, these papers are scattered and do not deal exclusively with Chilean Myrtaceae. In the present paper I wish to leave out, for most species, much information included in a monograph, such as: discussions of intergeneric relationships and nomenclatural history; citation of type specimens; treatment of non-Chilean species; and lists of representative specimens. The keys and discussion of the present paper have been designed for one dealing only with the Chilean flora.

There has been no comprehensive treatment of the family in Chile since the work of Reiche (1897), well before modern concepts of genera and species of Chilean Myrtaceae had been formed. Kausel (1942, 1944, 1948, 1949) wrote a series of very useful papers on Chilean Myrtaceae but he never published a family treatment in a single paper. Navas (1970) provided a key to the species represented in SGO (Museo de Historia Natural, Santiago, Chile) and cited the specimens housed there. Her work is largely based on the publications of Kausel.

The Myrtaceae of Chile are found from coastal Coquimbo to the southern tip of South America. They grow in the humid temperate forests of southern Chile and adjacent Argentina and in the Mediterranean sclerophyllous vegetation of central Chile. The Myrtaceae of Chile and adjacent southwestern Argentina are growing in a climatic and vegetational island bounded by very dry deserts in the north and east and oceans to the west and south. The forest vegetation of southwestern Argentina is essentially the same

as that found in southern Chile, all the Myrtaceae of the region growing in Chile as well. The keys and descriptions in this paper are equally applicable to Myrtaceae of southwestern Argentina and the distribution maps include that region.

The phytogeographic relationships of the Myrtaceae of Chile will be the subject of another paper but will be summarized here. Nine genera of Myrtaceae are found in the above-described climatic and vegetational island: *Legrandia*, *Luma*, and *Amomyrtus* are endemic and have no clear relationships in other regions. *Myrceugenia*, *Blepharocalyx*, and *Myrcianthes* have disjunct distributions across South America, other species being found in eastern temperate and subtropical Brazil, Paraguay, Uruguay, and northeastern Argentina. *Tepualia*, *Ugni*, and *Myrteola* are closely related to genera of Australasia. *Blepharocalyx*, *Myrcianthes*, *Ugni*, and *Myrteola* have disjunct populations in the Andes of northern Argentina and/or farther north.

MYRTACEAE A. L. Jussieu, 1789

The Myrtaceae can be distinguished from other families by having (1) persistent leaves with entire margins; (2) usually whitish flowers with inferior ovaries and numerous stamens; and (3) unligified portions of the plant dotted with glands containing viscous aromatic substances (terpenoids and polyphenols). All the native Chilean Myrtaceae have opposite leaves, but the commonly cultivated genus *Eucalyptus* of Australia has alternate leaves at maturity.

Myrtaceae have traditionally been divided into two tribes or subfamilies based on fruit structure: Leptospermeae (or Leptospermoideae) with dry, usually capsular fruits; and Myrteae (or Myrtoideae) with fleshy, berry fruits. Only one capsular fruited species occurs in America, *Tepualia stipularis*. The Myrteae are divided into subtribes based on embryo structures described below.

The following description is applicable to native Chilean Myrtaceae only.

Subshrubs, shrubs, or trees to about 20 m high, usually aromatic, sometimes strongly so, usually growing in relatively humid habitats, the trunks often with smooth or scaly bark, often orangish or light brown to white; hairs unicellular, simple or dibrachiate (two armed). Leaves persistent, coriaceous to submembranous, opposite, the venation usually brochidodromous, i.e., with a

strong midvein and lateral veins connected by arches near the margin, the connecting arches termed the marginal vein; inflorescence uniflorous (Fig. 10A), a dichasium (Fig. 1A, D, E), or a bracteate shoot (Fig. 3A) of uniflorous peduncles (i.e., a raceme), the peduncles solitary or sometimes (especially in *Myrceugenia*) superimposed in pairs or triplets in the axils of leaves; flowers pentamerous or tetramerous, whitish or sometimes pinkish in *Ugni*; stamens usually numerous (as few as 9 in *Myrteola*), the anthers laterally dehiscent (or introrsely dehiscent in *Ugni*); ovary inferior, 2–4-locular; placentation axil (sometimes appearing apical) or basal (in *Tepualia*), the ovules few to numerous, biseriate or multiseriate. Fruit a locucidal capsule in *Tepualia*, otherwise a berry; seeds 1–several, linear

in *Tepualia*, subglobose, lenticular, or reniform in berry-fruited genera, the seed coats membranous to hard and stony; embryo linear in *Tepualia*, variable, and of great taxonomic importance in the berry-fruited genera, the following types being found: (1) the hypocotyl about as long as or longer than the linear to oblong cotyledons (*Amomyrtus*, *Blepharocalyx*, *Legrandia*, *Myrteola*, *Ugni* of subtribe Myrtinae) (Fig. 3H); (2) the cotyledons leafy and folded in a bundle around which is wrapped the hypocotyl (*Myrceugenia* of subtribe Myrciinae) (Fig. 11A); (3) the cotyledons thick, planoconvex, and the hypocotyl insignificant (*Myrcianthes* of subtribe Eugeniinae); (4) the slightly fleshy, suborbicular cotyledons of about equal length as the hypocotyl (*Luma* of uncertain affinities) (Fig. 11B).

KEY TO GENERA FOR FRUITING SPECIMENS

1. Fruit a capsule 1. *Tepualia*
1. Fruit a berry
 2. Subshrub, creeping along the surface or up to ca. 1 m high; leaves mainly less than 1 cm long, bullate beneath, the lower epidermis becoming detached; seeds less than 2 mm long; bracteoles persistent, foliaceous; calyx lobes 4–5 on the same plant 6.1. *Myrteola nummularia*
 2. Trees or shrubs often over 1 m high; some leaves normally over 1 cm long, not bullate, the lower epidermis never becoming detached; seeds over 2 mm long (except in *Ugni*); bracteoles and calyx various
 3. Calyx lobes 4
 4. Fruit ca. 1.5–2.5 cm in diameter, yellowish; seed ca. 1.3–2 cm long, the embryo essentially a solid ellipsoidal to subglobose mass, the cotyledons insignificant; Andes below ca. 1,000 m from Curicó to Ñuble 5.1. *Legrandia concinna*
 4. Fruit up to ca. 1 cm in diameter, variously colored; seed up to ca. 0.6 cm long, the embryo never a solid ellipsoidal or subglobose mass, the cotyledons making up at least half the embryo (except in *Blepharocalyx*)
 5. Ripe fruit orange, yellow, or reddish; cotyledons leafy, folded into a bundle; hypocotyl long, encircling the cotyledons 8. *Myrceugenia*
 5. Fruit purple to black; embryo various
 6. Bracteoles persistent until the fruit matures; fruit usually maturing 2–12 mo after anthesis; cotyledons folded into a bundle, membranous; hypocotyl encircling the cotyledons (Fig. 11A) 8. *Myrceugenia*
 6. Bracteoles caducous at about anthesis; fruit usually maturing soon after anthesis; cotyledons not folded into a bundle, membranous or fleshy; hypocotyl not encircling cotyledons
 7. Leaf apex acute or acuminate; cotyledons about round, as long as the hypocotyl (Fig. 11B) 9. *Luma*
 7. Leaf apex obtuse to emarginate; cotyledons narrow, much shorter than the hypocotyl 4. *Blepharocalyx*
 3. Calyx lobes 5 (or mainly 5 and less often 4 on the same plant in *Ugni*)
 8. Bracteoles persistent until fruit matures; seed ca. 1–2 mm long, the seed coat hard 7. *Ugni*

8. Bracteoles caducous at about anthesis; seed more than 2 mm long, the seed coat hard or membranous
9. Leaves 1.4–3.5 times as long as wide; apex often mucronate; margin not revolute; seed coat hard; hypocotyl much longer than cotyledons; Concepción to Aisén 3. *Amomyrtus*
9. Leaves 0.9–1.6 times as long as wide; apex never mucronate; margin often revolute; seed coat soft; cotyledons much longer than hypocotyl; coast of Coquimbo 2.1. *Myrcianthes coquimbensis*

KEY TO GENERA FOR FLOWERING SPECIMENS

1. Flowers pentamerous, or tetramerous and pentamerous on the same plant in *Myrteola* and *Ugni*
2. Bracteoles persistent until after anthesis
 3. Filaments 5–10 times as long as the subglobose anthers; stamens exserted; flowers erect 6.1. *Myrteola nummularia*
 3. Filaments 1–3 times as long as the sagitate anthers; stamens included; flowers nodding 7. *Ugni*
2. Bracteoles (at least the great majority) caducous at or before anthesis
 4. Two corky epidermal protrusions present on the twig at the base of most petioles, these stipule-like; leaves lanceolate, usually no more than 1.5 cm long, the lower epidermis of the leaf often wrinkled, often becoming detached, bullate 1.1. *Tepualia stipularis*
 4. No corky epidermal protrusions present; leaves various, often over 1.5 cm long, the lower epidermis not wrinkled, not becoming detached, not bullate
 5. Leaves 1.4–3.5 times as long as wide; apex often mucronate; margin not revolute; peduncles ca. 0.3–0.5 mm wide, uniflorous, often grouped together in bracteate shoots (racemes); Concepción to Aisén 3. *Amomyrtus*
 5. Leaves 0.9–1.6 times as long as wide; apex never mucronate; margin often revolute; peduncles ca. 1 mm wide at middle, uniflorous or triflorous, not grouped together in bracteate shoots (racemes); coast of Coquimbo 2.1. *Myrcianthes coquimbensis*
1. Flowers tetramerous
 6. Subshrub, creeping along the surface or up to ca. 1 m high; leaves mainly less than 1 cm long, bullate beneath; stamens up to ca. 16 6.1. *Myrteola nummularia*
 6. Trees or shrubs often over 1 m high; some leaves normally over 1 cm long, not bullate, the lower epidermis never becoming detached; stamens rarely less than 20
 7. Bracteoles foliaceous, caducous at about anthesis, elliptic, ca. 7–9 mm long, 2–4 mm wide; disk ca. 6 mm across; style ca. 9–12 mm long; Andes from Curicó to Ñuble at about 700–1,000 m 5.1. *Legrandia concinna*
 7. Bracteoles not foliaceous (except in *Myrceugenia obtusa*, or rarely in *M. correifolia*, then only 2–7 mm long); disk up to ca. 4 mm across; style usually less than 9 mm long
 8. Bracteoles persistent until after anthesis, normally until fruit matures 8. *Myrceugenia*
 8. Bracteoles caducous at or before anthesis
 9. Leaf apex obtuse to emarginate; twigs often 4-angled; hairs dibrachiate; ovules multiseriate 4.1. *Blepharocalyx cruckshanksii*
 9. Leaf apex acute or acuminate; twigs not 4-angled; hairs simple; ovules normally biseriate
 10. Leaves lanceolate to ovate, 2.8–7.3 cm long; petiole 2–5 mm long; peduncles uniflorous, mainly borne in bracteate shoots (racemes); Masatierra, Juan Fernández 8.5. *Myrceugenia fernandeziana*
 10. Leaves mainly elliptic to suborbicular, 0.5–4.5 cm long; petiole 0.5–2 mm long; peduncles uniflorous or bearing dichasia, only rarely borne in bracteate shoots; mainland Chile and adjacent Argentina 9. *Luma*

LEPTOSPERMEAE A. P. de Candolle, 1826

1. **Tepualia** Grisebach, Syst. Bemerk. 31. 1854; Abh. Königl. Ges. Wiss. Göttingen 6:119. 1854.

Tepualia consists of a single species endemic to the forests of central and southern Chile and adjacent Argentina. I have not treated it in any other paper and thus cite types and representative specimens here.

- 1.1. **Tepualia stipularis** (W. J. Hooker et Arnott) Grisebach, Syst. Bemerk. 31. 1854; Abh. Königl. Ges. Wiss. Göttingen 6:119. 1854.

Myrtus stipularis W. J. Hooker et Arnott, Bot. misc. 3:316. 1833. Type, Chile. "Chiloe," *Cuming* 32 and 33 (syntypes at E-GL, *Cuming* 32 hereby designated as lectotype; *Cuming* 33, isoparatype, W; NY neg. 10835 of lectotype and paratype at E-GL).

Metrosideros stipularis (W. J. Hooker et Arnott) J. D. Hooker, Fl. antarct. 275. 1844.

Tepualia philippiana Grisebach, Syst. Bemerk. 32. 1854; Abh. Königl. Ges. Wiss. Göttingen 6:120. 1854. Type, Chile. "Valdivia; in Cordillera," *Philippi* 89 (holotype, GOET, n.v.; isotype, W; F neg. 23484 of isotype at G).

Tepualia patagonica R. A. Philippi, Anales Univ. Chile 84: 755. 1893. Type, Chile, Magallanes: "Habitat in Patagonia occidentali, loco dicto Rindgove Inlet in latit. austr. 49°49' et longit. 74°15'; Januario 1879 reperta," collector? (holotype, SGO, n.v.).

Tepualia stipularis var. *patagonica* (R. A. Philippi) Reiche, Anales Univ. Chile 98:726. 1897; Fl. Chile 2:310. 1898.

Tepualia stipularis var. *philippiana* (Grisebach) Spegazzini, Anales Mus. Nac. Hist. Nat. Buenos Aires 7:284. 1902.

Shrub or small tree up to ca. 7 m high, glabrous to minutely and obscurely puberulent; hairs simple, whitish, ca. 0.1 mm long; twigs glabrous to minutely and sparsely puberulent when young, glabrescent with age, chestnut brown at first, later becoming greyish to reddish brown, scaly, more or less 4-angled when young, the angles expanding into auriculate appendages lateral to the petiole bases, the appendages up to ca. 2 mm long, the longest produced at the beginning of a season's growth, those at later nodes progressively smaller, the buds covered with scales. Leaves lanceolate, ovate, elliptic, or suborbicular, 3–13 mm long, 2–6 mm wide, 1–4 times as long as wide, glabrous, the lower epidermis often becoming detached and bullate (at least in drying); apex obtuse; base rounded to subcordate; petiole more or less flat above, glabrous to sparsely puberulent, 1–2 mm long, 0.5–0.7 mm wide, ascending along twig; midvein indistinct to faintly visible; lateral veins indistinct or 2–3 pairs faintly visi-

ble, strongly ascending, nearly parallel to the midvein; marginal veins indistinct; blades dotted with glands, yellow green to grey green above, somewhat lighter and often tinged with brown below, subcoriaceous, the margins usually slightly revolute. Peduncles uniflorous, 2–9 mm long, ca. 0.5 mm wide, glabrous to sparsely puberulent, elongating and becoming curved as fruit matures, the bracteoles attached ca. 1–4 mm below the hypanthium; bracteoles linear, ca. 1–2 mm long, usually caducous before or at anthesis; calyx lobes 5, more or less triangular, ca. 1 mm long, ca. 2 mm wide; petals 5, ca. 2 mm long, suborbicular to obovate; hypanthium campanulate, 1.5–2.5 mm long, with 5 longitudinal ridges; disk ca. 2.5 mm across; style 6–8 mm long, glabrous, gynobasic; stamens 15–24, uniseriate, 4–8 mm long; anthers ca. 0.5 mm long; ovary (2–) 3(–4)-locular; ovules 5–22, basally attached, linear, about as long as locule. Fruit a locucidal capsule ca. 3 mm long; seeds linear, released through the top of the capsule, the sides of the capsule later wearing away between the ribs of the hypanthium (Fig. 1A, B).

DISTRIBUTION (Fig. 2A).—A tree or shrub of wet habitats, from Maule and Ñuble and then more or less continuously from Cautín to Magallanes in Chile; and from the Andean forests of Río Negro, Chubut, and Santa Cruz in Argentina.

REPRESENTATIVE SPECIMENS.—ARGENTINA. Chubut: Lago Menéndez, Lago Futalaufquén, 20 Jan 1938 (fl), *Kalela* 1833 (H). Río Negro: Nahuel Huapi, orilla occidental de la Laguna Frías, 28 Apr 1942 (fl), *Diem* 356 (CONC); Lago Nahuel Huapi, frente a Puerto Blest, 19 Jan 1940 (fl), *Perez Moreau* 34071 (H). Santa Cruz: Lago San Martín, Bajo Esperanza, 11–16 Apr 1944 (fr), *Grosse* 43 (CONC, H).

CHILE. Aisén: Isla Ofhidro (48°28'S, 74°05'W), 17 Jan 1968 (fl), *Anliot* 6044 (SGO); Puerto Aisén, 22 Jan 1962 (fl), *Behn* s.n. (CONC); Bahía Chantel, desembocadura del Río Baker, 8 May 1949 (fr), *Grosse* s.n. (CONC); Península Taitao, Estero Puelma (fl), *Grosse* 127 (SGO); Islas Chonos, Puerto Americano, 28 Feb 1921 (fl), *Hicken* s.n. (US); Isla Rivero, Estero Balladares (45°44'S, 74°21'W), 20 Jul 1970 (fr), *Parra* 71 (CONC); Tortel, frente a Canal Montalva (47°50'S, 73°34'W), 5 m, 5 Aug 1976 (fr), *Rodríguez* 816 (CONC); Rada Quesahuén, 25 m, Feb 1959 (fl), *Schlegel* 2053 (CONC); Estuario Elefantes, Puerto Bonito (45°56'S, 73°35'W), 30 m, 21 Feb 1967 (fl), *Seki* 186 (CONC); Río Exploradores entre Río Verde y Río Teresa (46°25'S, 73°20'W), 20 m, 2 Mar 1967 (fl), *Seki* 317 (CONC). Cautín: Conguillío, May 1972 (fl), *Weber* s.n. (EIF). Chiloé: Castro, Fundo Piruquina, 28 Jan 1933 (fl), *Behn* s.n. (CONC); camino a Chepu, 8 May 1972 (fr), *Landrum* s.n. (EIF); Quemchi, 11 May 1972 (fr), *Landrum* s.n. (EIF); Yaldad, ca. 10 km W of Quellón, 1–5 m, 7 Feb 1978 (fl), *Landrum* 3131 (MICH, VALD); Chaitén, 19 Feb 1961 (fl), *Marticoarena*

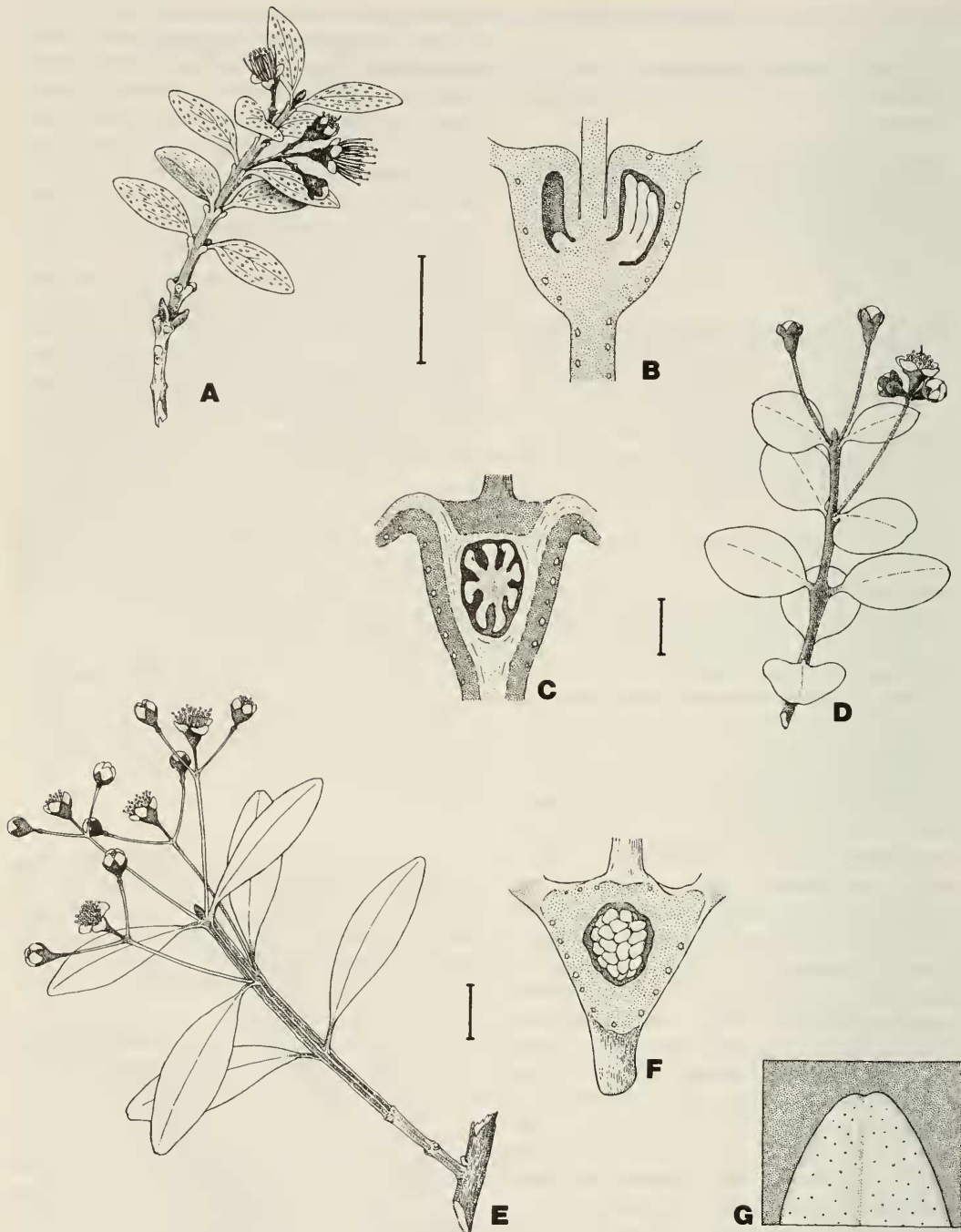


FIGURE 1. *Tepualia*, *Myrcianthes*, and *Blepharocalyx*. *Tepualia stipularis* (Pisano 1260 at H): A, a twig with flowers and buds showing epidermal appendages at the bases of leaves. B, section of ovary showing basally attached ovules and gynobasic style. *Myrcianthes coquimbensis* (Grosse s.n., 25 Oct 1946, at US): C, section of ovary showing peltate placenta. D, twig showing uniflorous and triflorous peduncles. *Blepharocalyx cruckshanksii* (Werdermann 301 at CAS): E, 4-angled twigs with dichasial inflorescences. F, section of ovary showing irregular rows of ovules. G, leaf tip showing emarginate apex. Bars = 1 cm for twigs and 1 mm for sections. Drawn by Terry Bell.

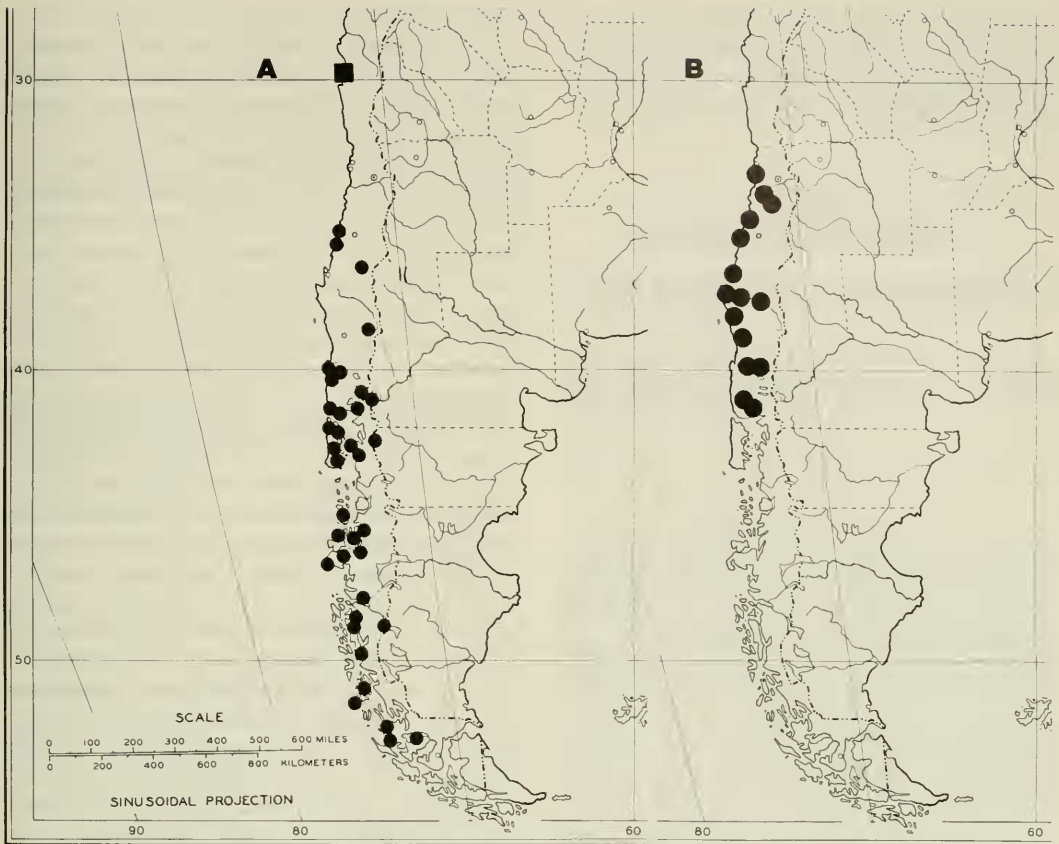


FIGURE 2. Distribution of *Tepualia stipularis* (A, circles), *Myrcianthes coquimbensis* (A, square), and *Blepharocalyx cruckshanksii* (B, circles).

1694 (CONC); Estero Palvitad, 25 Feb 1961 (fl), *Marticoarena* 1754 (CONC); Lago Natri, frente a Miraflores (42°47'S, 73°50'W), 85 m, 11 Jan 1975 (fl), *Marticoarena et al.* 63 (CONC); Isla Tranqui, Jan 1952 (fl), *Ramírez s.n.* (CONC); Islas Guaytecacas, Melinka, 7 Feb 1957 (fr), *Ricardi et al.* 4041 (CONC); Quinchao, Isla Talcán (42°46'S, 72°56'W), 30 m, 20 Feb 1972 (fr), *Urbina and Rizzo s.n.* (CONC). Llanquihue: camino a Calbuco, 17 Dec 1970 (fr), *Gajardo s.n.* (EIF); desembocadura del Río Maullín, entre Chanhue y Lepihue, orillas del mar, 26 Nov 1944 (st), *Kausel* 1509 (H); Ensenada, 13 Feb 1964 (fl), *Kausel* 4728 (H); faldeos Volcán Osorno, frente al Lago Todos Los Santos, 520 m, 27 Jan 1972 (fl), *Rodríguez* 20 (CONC). Magallanes: Hammick (48°44'S, 74°20'W), 4 Jan 1968 (fl), *Anliot* 6043 (SGO); Isla Fairway, Canal Smith, 16 Mar 1945 (fl), *Biese* 1335 (SGO); Isla Diego de Almagro, Pelantaro, 28 Mar 1945 (fl), *Biese* 1543 (SGO); Port Otway, 9 Feb 1888 (fl), *Lee s.n.* (US); Puerto Edén, 23 Jul 1970 (fr), *Parra* 99 (CONC); Puerto Bueno, 26 Jul 1970 (st), *Parra* 157 (CONC); Seno de Skyring, al pié del Monte Cupulo, 27 Apr 1908 (fl), *Skottsberg s.n.* (SGO); Canal Smith, Feb 1924 (fl), *Skottsberg* 133 (W). Maule: Constitución, Quebrada Honda, 7 Feb 1949 (fl), *Kausel* 2733 (H); camino Cauquenes a Pelluhue, Mar 1971 (fr), *Landrum and Donoso s.n.* (EIF, SGO). Ñuble: entre San Fabián de Alico y Los Sauces, 4 km antes de Los Sauces, 15 Oct 1970 (fr), *Weldt* 476 (CONC). Osorno: summit of Cordillera de la Carpa,

950 m, 1–3 Feb 1958 (fr), *Eyerdam* 10564 (US); Puyehue, camino a Antillanca, 22 Feb 1971 (fl), *Landrum s.n.* (EIF). Valdivia: Cordillera Pelada de Chaihuín, 400 m, 3 Jan 1932 (fl), *Gunkel* 3020 (H); Hueicolla, ca. 150 m, 17 Apr 1982 (fr), *Landrum* 4501 (NY, SGO); La Unión, Llanacura, Jan 1969 (fl), *Mahú* 2013 (H); orillas del Río Chamil, 19 Jan 1972 (fl), *Mahú* 8366 (H).

PHENOLOGY.—Flowering mainly from January to March; fruits maturing mainly from May to August.

LOCAL NAMES.—Tepu, trepu, tepual (for a forest) (Muñoz 1966).

Tepualia stipularis is superficially similar to *Myrteola nummularia* as a dried specimen, but is easily distinguished from all other Chilean Myrtaceae by its capsular fruits and the protuberant outgrowths of twig epidermis at the bases of its leaves.

Dawson (1972) has accepted *Tepualia* as a distinct monotypic genus in the subtribe *Metrosi-*

derinae. He believes that it is most closely related to *Mearnsia* Merrill of the Philippines, New Guinea, the Solomon Islands, New Caledonia, and New Zealand.

MYRTEAE

Eugeniinae Berg, 1856

2. *Myrcianthes* Berg, *Linnaea* 27:136 (in key), 315. Jan 1856.

Ananomis Grisebach, *Fl. Brit. W.I.* 240. 1860.

Reichea Kausel, *Revisión de las Mirtáceas Chilenas* 1. 1940.

Aspidogenia Burret, *Notizbl. Bot. Gart. Berlin-Dahlem* 15:522. 1941.

Acreugenia Kausel, *Ark. Bot.* 3:510. 1956.

Trees or shrubs, at least sometimes with smooth, somewhat scaly bark; hairs simple, unicellular. Leaves opposite or ternate, persistent, sometimes strongly coriaceous. Inflorescence typically a dichasium of 3–7 flowers, less often reduced to a single flower, the peduncles borne in the axils of leaves, solitary or rarely superimposed; flowers pentamerous or tetramerous; bracteoles caducous or persistent; ovary usually bilocular, the placenta attached to the central or upper part of the septum, the ovules 5–20 per locule. Fruit a berry, the seeds usually 1–2, the testa membranous; embryo subglobose, the cotyledons planoconvex, ununited, the hypocotyl small, shorter than the cotyledons.

Myrcianthes is widespread in subtropical eastern South America and in the Andes from northern Argentina to Venezuela. Two species are known from Central America, and one of these also grows in the Caribbean.

2.1. *Myrcianthes coquimbensis* (Barnéoud) Landrum et Grifo, *Brittonia* 40(3):290. 1988.

Myrtus coquimbensis Barnéoud, in Gay, *Fl. Chil.* 2:382. 1847.

Type. Chile. Coquimbo: "orilla del mar," Gay s.n. (lectotype, P, designated by Landrum and Grifo, 1988; isolectotype, F—fragment; photo of lectotype, SGO-4478).

Reichea coquimbensis (Barnéoud) Kausel, *Revisión de las Mirtáceas Chilenas* 1. 1940.

Aspidogenia coquimbensis (Barnéoud) Burret, *Notizbl. Bot. Gart. Berlin-Dahlem* 15:522. 1941.

Low, dense, rounded shrub usually ca. 1.5 m high, strongly glandular, glabrous or sometimes densely pubescent on young growth; hairs simple, straight or curved, grayish, mainly antrorse, up to ca. 0.3 mm long; twigs glabrous or sparsely

to densely pubescent at first, losing any hairs with age, the young bark dark to light reddish brown, smooth, with age becoming grey and slightly rough. Leaves elliptic, ovate, obovate, or suborbicular, 1–3.4 cm long, 0.6–3 cm wide, 0.9–1.6 times as long as wide, glabrous to densely covered with hairs when young, usually becoming glabrous with age; apex acute, rounded, or emarginate; base acute, rounded, or subtruncate; petiole 1–4 mm long, 1–1.5 mm wide, densely pubescent to glabrous; midvein flat or nearly so above, moderately prominent below; lateral veins indistinct or up to ca. 6 pairs faintly visible, these nearly perpendicular to the midvein; marginal veins indistinct; blades stiffly and thickly coriaceous, usually somewhat revolute, drying grey green to light reddish brown, somewhat lighter below, sometimes lustrous above, sometimes blue green above (due perhaps to an epiphytic alga or lichen). Peduncles solitary, uniflorous or triflorous, 0.5–3 cm long, ca. 1 mm wide near middle, up to ca. 2 mm wide at apex, densely pubescent to glabrous; bracteoles linear, 1–2 mm long, ca. 0.2 mm wide, persisting until about anthesis; calyx lobes 5, unequal, subtriangular to hemiorbicular, usually 2, 1–1.5 mm long, and 3, 2–2.5 mm long; petals 5, oblong to suborbicular, ca. 5–6 mm long, glabrous except for a ciliate margin; hypanthium obconic to campanulate, 3–4 mm long, glabrous to densely pubescent, strongly glandular; disk 3–5 mm across, glabrous or pubescent; style 7–10 mm long, glabrous; stamens ca. 140–150, 6–10 mm long; anthers 0.3–0.5 mm long; ovary 2-locular; ovules 5–11 per locule, radiating from a shortly stalked subpeltate placenta attached to about the center of the septum. Fruit subglobose, 1–2 cm in diam.; seeds usually 1, ca. 1–1.5 cm thick (Fig. 1C, D).

DISTRIBUTION (Fig. 2A).—*Myrcianthes coquimbensis* has a rather restricted distribution in Coquimbo, being known to grow only along the coast from about 20 km south of La Serena (Torralillo) to about 40 km north of the same city (Punta Calavera) (Landrum and Grifo 1988). It is a dense, rounded shrub, typically growing among large granitic boulders on ocean-facing slopes that receive almost constant cool moist breezes from the Pacific.

PHENOLOGY.—Flowering October to December. Fruits may require several months to mature.

LOCAL NAMES.—Arrayán, lucumillo, lucumilla (Muñoz 1966).

Myrcianthes coquimbensis is easily distinguished from other species of Chilean Myrtaceae by a combination of pentamerous flowers and strongly coriaceous leaves with revolute margins.

This species has only recently been transferred to *Myrcianthes* (Landrum and Grifo 1988). Many specimens may still be found in herbaria under *Reichea* or *Myrtus*.

Myrtinae

3. *Amomyrtus* (Burret) Legrand et Kausel, Lilloa 13:145. ("1947") 1948.

Pseudocaryophyllus Berg, sect. *Amomyrtus* Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:514. 1941.

Aromatic shrubs or trees up to ca. 20 m high, with smooth or somewhat scaly bark; hairs simple, unicellular. Leaves opposite, persistent, coriaceous, usually lanceolate or ovate. Inflorescence a solitary flower or bracteate shoot of ca. 6 flowers, the peduncles solitary (or rarely superimposed); flowers pentamerous; bracteoles caducous at or before anthesis; ovary 2–3-locular, the placenta attached to the upper septum, more or less shield-shaped, the ovules radiating from the placental margin; fruit a berry, the seeds hard, few, shaped like a snail's shell with a single coil, 4–6 mm long; embryo C-shaped, the cotyledons short, folded back against the hypocotyl.

Amomyrtus is distinguished from all other genera of Chilean Myrtaceae by its pentamerous flowers, hard seeds 4–6 mm long, and strongly aromatic leaves.

Both species of *Amomyrtus* have very hard wood that is utilized for tool handles and lumbering and farming equipment or wherever very strong wood is needed.

KEY TO THE SPECIES OF *AMOMYRTUS*

1. Trunk reddish brown with lighter spots; twigs densely to moderately pubescent; leaves moderately aromatic, seldom over 3 cm long or 1.5 cm wide; calyx lobes linear, linear oblong, or narrowly triangular; seed 4–4.5 mm long, grey green; hypanthium 2–2.5 mm long, not noticeably glandular; usually growing near water 3.1. *A. luma*
1. Trunk more or less uniformly whitish; twigs obscurely pubescent to glabrous; leaves strongly aromatic, often over 3 cm long and 1.5 cm wide; calyx lobes approximately tri-

angular, slightly wider than long; seed ca. 5–6 mm long, whitish; hypanthium 2.5–3.5 mm long, strongly glandular; usually growing as an understory tree in upland habitats

..... 3.2. *A. meli*

3.1. *Amomyrtus luma* (Molina) Legrand et Kausel, Lilloa 13:146. ("1947") 1948.

Myrtus luma Molina, Sag. stor. nat. Chili, ed. 1, 173. 1782.

Myrtus multiflora Jussieu ex Jaume Saint-Hilaire, in Duhamel, Traité arbr. arbust., ed. 2, 1:208. 1800–1803.

Eugenia darwinii J. D. Hooker, Fl. antarct. 277. 1846.

Myrtus darwinii (J. D. Hooker) Barnéoud, in Gay, Fl. Chil. 2: 383. 1847.

Myrcia lechleriana Miquel, Linnaea 25:651. 1852.

Myrtus valdiviana R. A. Philippi, Linnaea 28:688. 1858.

Pseudocaryophyllus darwinii (J. D. Hooker) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:514. 1941.

Shrub or tree up to ca. 20 m high, moderately aromatic, moderately to densely pubescent on young growth, the trunk smooth, reddish brown with lighter large spots where the bark has recently fallen; hairs whitish, most ca. 0.3–0.5 mm long, erect to antrorse; twigs densely to moderately pubescent, the bark at first light reddish brown to grey, with age splitting in a reticulate pattern, revealing reddish brown inner bark. Leaves elliptic, elliptic-oblong, ovate, or lanceolate, 1.4–2(–5) cm long, 0.6–1.5(–2.5) cm wide, 1.5–3 times as long as wide, essentially glabrous except for the midvein that is usually pubescent above; apex acute to abruptly acuminate or rounded, often mucronate; base acute or cuneate; petiole unchanneled to shallowly channeled, 2–4 mm long, 0.5–1 mm wide, densely pubescent to glabrous; midvein flat to slightly raised, prominent below; lateral veins indistinct or up to ca. 10 pairs faintly visible; marginal veins more or less equalling the laterals in prominence, paralleling the margin; blades usually stiffly coriaceous, drying grey green to dark reddish brown, often with many recessed pores above. Peduncles solitary, 0.5–2 cm long, 0.3–0.5 mm wide, densely to sparsely puberulent, usually grouped together on bracteate shoots, the shoot axes up to ca. 2.5 cm long, the bracts scalelike to elliptic, ca. 1–2.5 mm long, caducous at or before anthesis; bracteoles narrowly linear, ca. 1 mm long; calyx lobes linear, linear-oblong, or narrowly triangular with the sides concave, 1–1.5 mm long, the sinuses between the lobes broadly U-shaped; petals suborbicular, ca. 3 mm long; hypanthium obconic, 2–2.5 mm long, not noticeably glan-

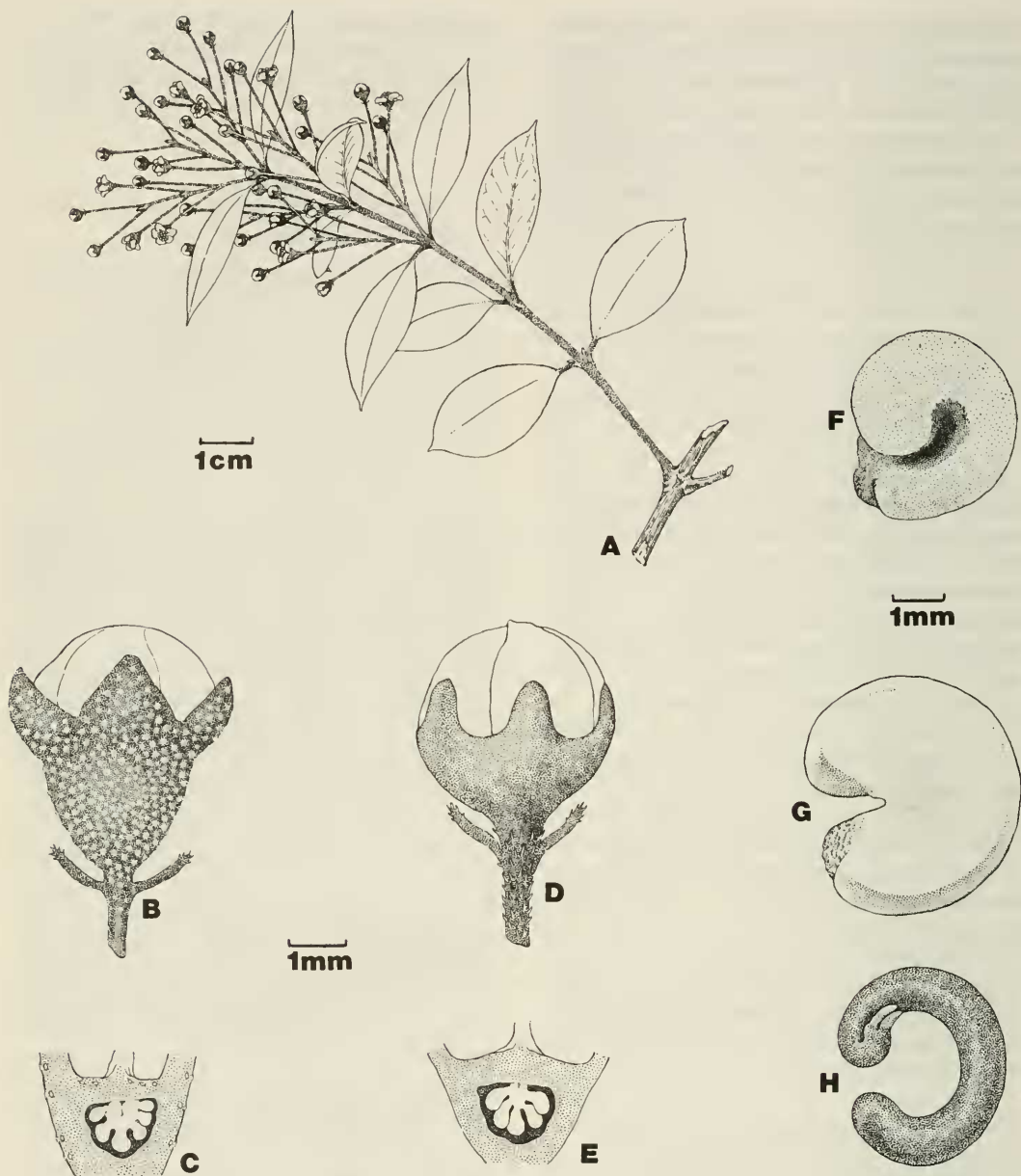


FIGURE 3. *Amomyrtus*. *Amomyrtus luma* (A, D, E from Gunckel 1779 at UC; F from Landrum 3144 at NY): A, twig showing bracteate shoot (raceme) inflorescences. D, bud. E, section of ovary showing placenta and ovules. F, seed. *Amomyrtus meli* (B, C from Kausel 1434 at F; G, H from Landrum 3193 at NY): B, bud. C, section of ovary showing placenta and ovules. G, seed. H, embryo. Drawn by Terry Bell.

dular, reddish brown, glabrous or nearly so; disk 2.5–4 mm across, glabrous; style 4–8 mm long, glabrous; stamens ca. 30–45, ca. 4–5 mm long; anthers 0.5 mm long; ovary 2–3-locular; ovules ca. 4–6, the placenta ca. 0.3 mm wide. Fruit black, subglobose, ca. 5–10 mm in diam.; seeds 1–3 per

fruit, smooth, hard, grey green, ca. 4–4.5 mm long, the seed coat wall ca. 0.2 mm thick, the embryo purple (Fig. 3A, D–F).

DISTRIBUTION (Fig. 4B).—A tree, usually of wet habitats from Maule to Aisen in Chile and from Neuquén to Chubut in the Andes of Argentina.

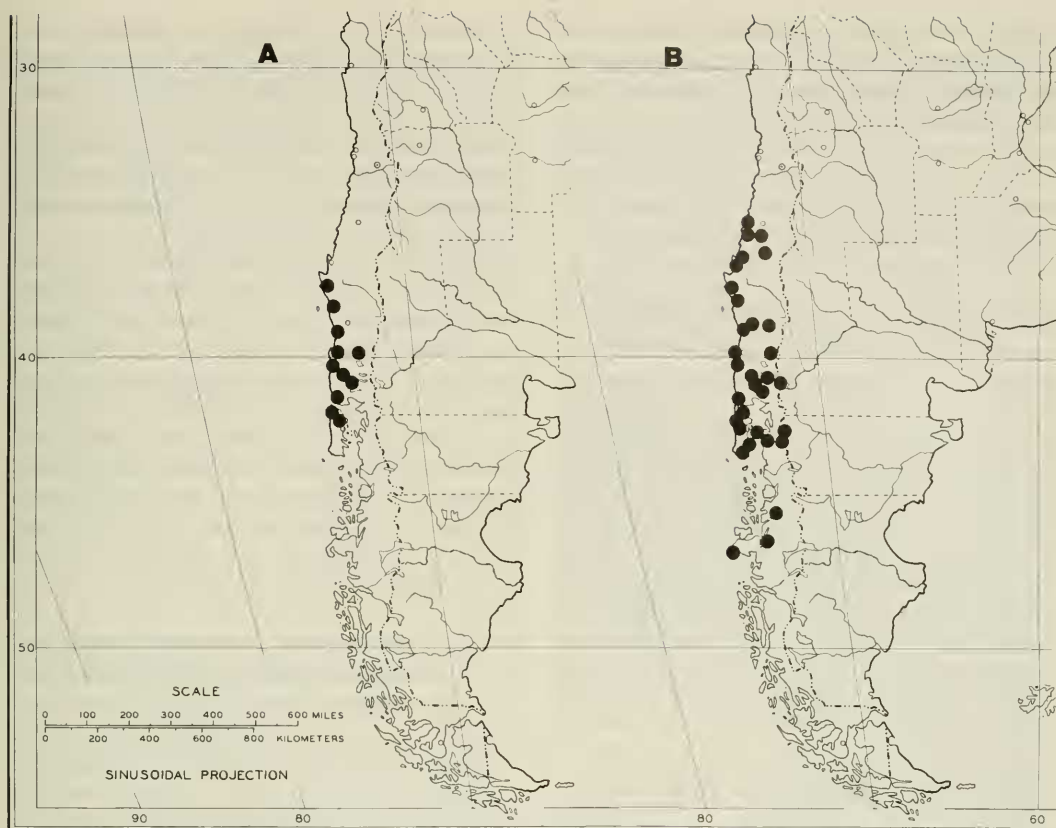


FIGURE 4. Distribution of *Amomyrtus meli* (A) and *A. luma* (B).

PHENOLOGY.—Flowering from September to February, reaching a peak in November. Fruits mainly maturing from February to April.

LOCAL NAMES AND USES.—Luma, palo mardoño, cauchao, caochao, cauchahue (Muñoz 1966). *Amomyrtus luma* is said to be used (probably as a leaf tea) as a stimulant and astringent (Muñoz et al. 1981). The fruits are edible and are fermented to make a chicha.

Amomyrtus luma can be distinguished from other species of Chilean Myrtaceae by its reddish brown bark with lighter spots. The bark is not so orange as it is in *Luma apiculata* and *Blepharocalyx cruckshanksii*. *Amomyrtus luma* has strongly aromatic leaves, somewhat less pungent than those of *A. meli*, but with a distinctive fragrance.

3.2. *Amomyrtus meli* (R. A. Philippi) Legrand et Kausel, Lilloa 13:146. ("1947") 1948.

Myrtus meli R. A. Philippi, Linnaea 28:638. 1857.

Pseudocaryophyllus meli (R. A. Philippi) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:515. 1941.

Tree up ca. 20 m high, strongly aromatic, usually only obscurely pubescent on young growth, the trunk with smooth whitish bark, not strongly mottled; hairs whitish, up to ca. 0.3 mm long, usually curved antrorsely; twigs only obscurely pubescent to glabrous, the bark greyish white or light reddish brown, smooth at first, becoming longitudinally broken, longitudinal strips persisting beneath the leaf scars. Leaves ovate, lanceolate, or elliptic, 2–5(–9) cm long, 0.7–2.5(–3) cm wide, 1.4–3.5 times as long as wide; apex acute, often mucronate; base acute; petiole unchanneled to shallowly channeled, 2–4 mm long, 1–2 mm wide, yellowish brown; midvein about flat or slightly raised above, moderately prominent below; lateral veins indistinct or up to ca. 7 pairs faintly visible, the lower pairs ascending, the upper pairs leaving the midvein at an angle of 45 degrees or more; marginal veins about

equalling the laterals in prominence; blades stiffly coriaceous, drying grey green to yellow green, dull to slightly lustrous above. Peduncles solitary (rarely superimposed), 0.4–2 cm long, ca. 0.5 mm wide, glabrous to minutely puberulent, moderately glandular, usually grouped together in bracteate shoots, the bracts caducous before anthesis, elliptic, 1.5–2 mm long; bracteoles linear, ca. 1–1.5 mm long; calyx lobes glabrous, approximately triangular, ca. 1–1.5 mm long, slightly wider than long, the sides nearly straight or slightly concave; petals suborbicular, ca. 3–4 mm long, glabrous, or the margin ciliate; hypanthium obconic, ca. 2.5–3.5 mm long, ca. 3 times as long as the calyx lobes, more or less smooth when dry, densely glandular, the glands noticeable as white spots when dry; disk ca. 4 mm across, glabrous; style 7–8 mm long, glabrous; stamens ca. 40–80, ca. 5–7 mm long; anthers ca. 0.5–0.8 mm long; ovary 2-locular; ovules 5–8 per locule, the placenta ca. 0.5–0.7 mm wide. Fruit black, subglobose, ca. 1–1.5 cm in diam.; seed hard, light colored, smooth, somewhat shiny, ca. 5–6 mm long, the seed coat wall ca. 0.25 mm thick (Fig. 3B, C, G, H).

DISTRIBUTION (Fig. 4A).—A tree, usually of upland habitats in wet forests from Arauco to Chiloé.

PHENOLOGY.—Flowering from October to December but mainly in November. Fruits probably mature mainly from March to May.

LOCAL NAME.—Meli.

Amomyrtus meli is usually distinguishable from other Chilean Myrtaceae by its smooth, light bark. The strong aroma of the crushed leaves is distinctive, and once experienced, is easily recognized. The leaves lose most of their aroma upon drying. The fruits are pleasant tasting when ripe.

4. *Blepharocalyx* Berg, Linnaea 27:348 (in key). Jan 1856 ("1854"); 412. Feb 1856.

Temu Berg, Linnaea 30:710. 1861.

Marlieriopsis Kiaerskou, Bot. Tidsskr. 17:281. 1890.

Blepharocalyx subgen. *Temu* (Berg) Niedenzu in Engler et Prantl, Nat. Pflanzenfam. 3(7):71. 1893.

Shrubs or trees up to 30 m high; hairs unicellular, simple or symmetrically or asymmetrically dibrachiate, up to ca. 1 mm long. Inflorescence a dichasium of 3 to about 15 flowers in our species; flowers tetramerous, the calyx of 4 separate calyx lobes that persist until the fruit matures in our

species; ovary bilocular; ovules aggregated near the center of the septum, aligned in a few irregular rows. Fruit a globose berry; seeds 1–9 in our species, reniform, the testa membranous to cartilaginous; embryo C-shaped in our species, in others reniform, spiral, or nearly straight, the hypocotyl thickened, the cotyledons relatively small, at times scarcely detectable.

Blepharocalyx has three species: *B. cruckshanksii*, an endemic of the forests of southern South America; *B. salicifolius* of southeastern Brazil and along the Andes from Northern Argentina to Colombia; and *B. eggersii* of northern South America and the southeastern Caribbean (Landrum 1986). For many years the Chilean members of the genus have been segregated as the genus *Temu*. I have found that the differences between *B. cruckshanksii* and the other species are minor and thus, I have followed Niedenzu in not accepting *Temu*.

4.1. *Blepharocalyx cruckshanksii* (W. J. Hooker et Arnott) Niedenzu, in Engler et Prantl, Nat. Pflanzenfam. 3, Abt. 7:71. 1893.

Eugenia cruckshanksii W. J. Hooker et Arnott, Bot. misc. 3: 321. 1833.

Luma cruckshanksii (W. J. Hooker et Arnott) A. Gray, U.S. Expl. Exped., Phan. 540. 1854.

Eugenia divaricatum Berg, Linnaea 27:257. 1856.

Eugenia divaricatum [var.] α *obovata* Berg, Linnaea 27:257. 1856.

Eugenia divaricatum [var.] β *ovalis* Berg, Linnaea 27:258. 1856.

Eugenia divaricatum [var.] γ *pauciflora* Berg, Linnaea 27:258. 1856.

Temu cruckshanksii (W. J. Hooker et Arnott) Berg, Linnaea 30:711. 1861.

Temu divaricatum (Berg) Berg, Linnaea 30:711. 1861.

Blepharocalyx divaricatus (Berg) Niedenzu, in Engler et Prantl, Nat. Pflanzenfam. 3, Abt. 7:71. 1893.

Blepharocalyx divaricatus var. *obovatus* (Berg) Reiche, Anales Univ. Chile 98:707. 1897.

Blepharocalyx divaricatus var. *ovalis* (Berg) Reiche, Anales Univ. Chile 98:707. 1897.

Blepharocalyx divaricatus var. *pauciflorus* (Berg) Reiche, Anales Univ. Chile 98:707. 1897.

Shrub or tree up to 15 m high, the trunk smooth reddish brown; hairs whitish, symmetrically or asymmetrically dibrachiate, up to ca. 0.3(–0.5) mm long; young twigs sparsely pubescent to glabrous, often 4-angled. Leaves elliptic, oblong, elliptic-ovate or elliptic-oblongate, 1.7–5.5(–8) cm long, 0.8–3 cm wide, 1.5–2.6 times as long as wide, glabrous or essentially so; apex obtuse or emarginate; base cuneate, acute, acuminate or rounded; petiole slightly channelled, 2–5 mm long,

0.5–1 mm wide, moderately pubescent to glabrous; midvein about flat or slightly raised above, moderately prominent below; lateral veins indistinct or up to ca. 10 pairs moderately distinct; marginal veins equalling the laterals in prominence, looping between them, more or less parallel to the margin; blades submembranous to subcoriaceous, drying grey green, yellowish green, or reddish brown, somewhat darker above than below. Peduncles 1–4.5 cm long, ca. 0.5 mm wide, densely pubescent to glabrous, bearing a dichasium of 3 to ca. 15 flowers, the secondary branches of the dichasium ca. 0.5–1.5 cm long; bracteoles linear, ca. 1.5–2.5 mm long, ca. 0.3 mm wide, caducous at anthesis or before, glabrous to sparsely (rarely densely) pubescent; calyx lobes triangular-ovate, ca. 1–3 mm long and wide, not strongly concave, sparsely (rarely densely) pubescent to glabrous without, sparsely to densely pubescent within; petals suborbicular, ca. 1.5–2.5 mm in diam., sparsely pubescent to glabrous; hypanthium glabrous to sparsely (rarely densely) pubescent, attenuate, funnel-shaped, 2.5–5 mm long; disk ca. 3 mm across, sparsely pubescent to glabrous; stamens ca. 90–140, ca. 5–8 mm long; style ca. 7–8 mm long, glabrous to subglabrous; ovary 2–3-locular; ovules 8–15 per locule. Fruit globose, ca. 7 mm in diam., purple when mature; seeds reniform, ca. 3–4 mm long, 1–9 per fruit, the embryo C-shaped (Fig. 1E–G).

DISTRIBUTION (Fig. 2B).—A small tree of moist, often swampy habitats, endemic to the forests of central and southern Chile from Aconcagua to Llanquihue.

PHENOLOGY.—Flowering mainly from December to February. Fruits maturing from February to April.

LOCAL NAMES.—Temu, palo colorado.

This is one of the most common Myrtaceae in south-central Chile. The bark is often an attractive orange or reddish brown color, as it is in *Luma apiculata* of the same region. The common name temu is applied to both species. The name of a city in southern Chile, Temuco, means “temu water” in the indigenous language, Mapuche.

Flowering specimens of *Blepharocalyx cruckshanksii* are occasionally confused with *Myrceugenia exsucca* because both have well-developed dichasial inflorescences. But, *Blepharocalyx* has deciduous bracteoles, whereas in *Myrceugenia exsucca* they are persistent; in *B. cruckshanksii*

the leaf apices are often emarginate, in *M. exsucca* they are not; in *B. cruckshanksii* the hypanthium and twigs are usually only sparsely pubescent and in *M. exsucca* they are usually densely pubescent.

5. **Legrandia** Kausel, Revista Argent. Agron. 9: 321. 1944. *Legrandia* is a monotypic genus endemic to Chile.

5.1. **Legrandia concinna** (R. A. Philippi) Kausel, Revista Argent. Agron. 9:322. 1944.

Eugenia concinna R. A. Philippi, Linnaea 28:640. 1857.

Small tree up to perhaps 8 m high, the young growth sparsely to moderately pubescent; hairs simple, unicellular, whitish, up to ca. 1 mm long; young twigs 4-angled, reddish brown, sparsely to moderately pubescent, with age becoming somewhat rough, grey, subterete, the bark becoming slightly stringy. Leaves elliptic, elliptic-oblong, oval, ovate-elliptic, obovate, 2–5.5 cm long, 0.8–3 cm wide, 1.8–2.8 times as long as wide, glabrous to sparsely pubescent along the midvein and margins, often possessing cavities in the axils of the main lateral veins below, these having ciliate margins; apex obtuse to rounded; base obtuse, cuneate, or acuminate; petiole shallowly channeled, 1–3 mm long, ca. 1 mm thick, glabrous to moderately pubescent; midvein impressed above, prominent below; lateral veins ca. 5–8 pairs moderately prominent, leaving the midvein at an angle of ca. 45 degrees, looping broadly to connect with the succeeding lateral, or splitting about $\frac{1}{2}$ – $\frac{2}{3}$ of the way to the margin, no clear marginal vein present; blades subcoriaceous, drying grey green to reddish brown. Peduncles uniflorous, 1–3.5 cm long, 0.7–2 mm wide, sparsely pubescent to glabrous, solitary in the axils of leaves; bracteoles foliaceous, elliptic, ca. 7–9 mm long, 2–4 mm wide; calyx lobes hemiorbicular-triangular, 3–4 mm long, 4–6 mm wide, glabrous within, sparsely pubescent without; petals 4, suborbicular, to obovate, ca. 7–10 mm long, glabrous except for a ciliate margin; hypanthium obconic to campanulate, 4–7 mm long, densely to moderately pubescent to villose; disk ca. 6 mm across, pubescent centrally, raised conically around the base of the style, the staminal ring glabrous; stamens ca. 200–400, 7–12 mm long; anthers ca. 0.7 mm long; style ca. 9–12 mm long, pubescent basally, otherwise glabrous; ovary 2–3-locular; ovules 5–11 per locule,

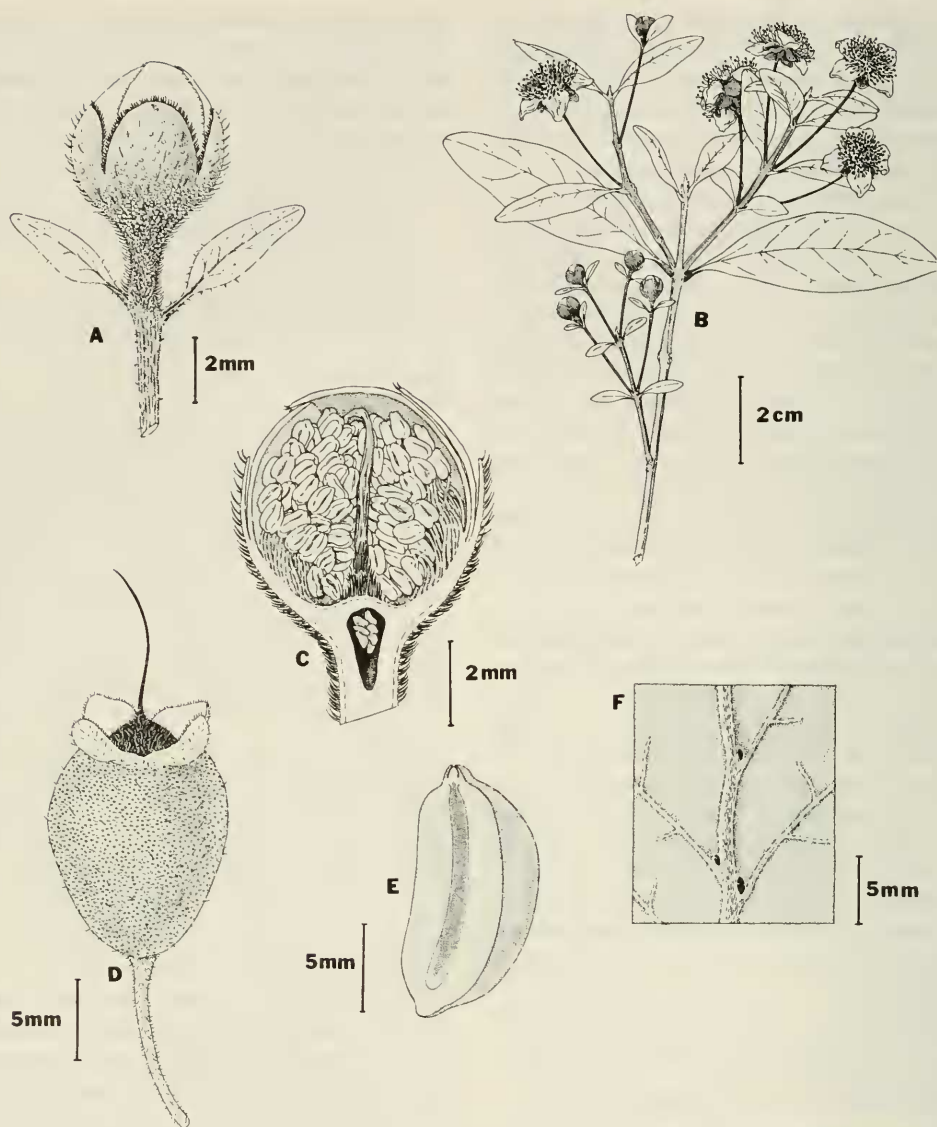


FIGURE 5. *Legrandia concinna* (Kausel 35 and Kausel 1516 at F): A, flower with bracteoles attached. B, young branch with flowers. C, longitudinal section of a flower. D, fruit. E, longitudinal section of an embryo. F, lower surface of a leaf showing cavities in the axils of the lateral veins. Drawn by Terry Bell.

more or less biseriate, attached to upper portion of the septum. Fruit subglobose, 1.5–2.5 cm long, drying reddish brown (yellowish when fresh), 1.5–2.5 cm long; seed usually solitary, less often 2–5 per fruit (ex Kausel 1949), the seed coat membranous, the embryo ellipsoidal to subglobose, about straight, ca. 1.3–2 cm long, the central vascular core making up ca. $\frac{1}{4}$ the diam. of the hypocotyl (Fig. 5).

DISTRIBUTION (Fig. 6).—A smooth-barked tree

of wet habitats in the Andes of central Chile from Curicó to Ñuble.

PHENOLOGY.—Flowering is in December and fruits mature in February and March.

LOCAL NAME.—Luma (Kausel 1944). This same name is applied to a few other Chilean species of Myrtaceae, e.g., *Amomyrtus luma*.

Legrandia concinna is readily recognized by its 4-angled young twigs, uniflorous peduncles



FIGURE 6. Distribution of *Legrandia concinna* (triangles) and *Myrteola nummularia* (circles).

bearing relatively large flowers, and foliaceous bracteoles. It is one of the rarest species of Chilean Myrtaceae. The generic name honors Dr. Diego Legrand of Montevideo, Uruguay, an important student of South American Myrtaceae.

6. *Myrteola* Berg, Linnaea 27:393. 1856, nom. cons.

Amyrsia Rafinesque, Sylva tellur. 106. 1838, nom. rejic.
Chuacena Rafinesque, Sylva tellur. 104. 1838, nom. rejic.

Subshrubs or shrubs up to ca. 4 m high; hairs simple, unicellular. Leaves opposite, decussate, often markedly 4-ranked, up to ca. 11 mm long, coriaceous. Inflorescence a solitary flower borne in the axil of a leaf, the peduncles solitary; flowers pentamerous or tetramerous, sometimes both types on a single plant; bracteoles foliaceous, linear to elliptic, persistent; stamens 9–75, the filament mainly longer than the anther during development and at maturity; ovary 2–3-locular, the septum between locules sometimes not complete, the ovules 2–14, biseriate. Fruit a berry ca. 5–8 mm in diam.; seeds 1.2–3 mm long, hard, shiny, smooth, not strongly angular, the seed coat ca. 0.1 mm thick, the inner cavity of the seed C-shaped; embryo C-shaped, the cotyledons nearly as long as the hypocotyl, not folded back against the hypocotyl.

A South American genus of three species of high elevations in the tropical Andes and humid temperate regions (Landrum 1988). *Myrteola* appears to have very close relatives in New Zealand (*Neomyrtus*) and New Caledonia (*Myrtastrum*).

6.1. *Myrteola nummularia* (Poirot) Berg, Linnaea 27:396. 1856.

Myrtus nummularia Poirot in Lamarck, Encycl. 407. 1798.

Myrteola nummularia var. β , *major* J. D. Hooker, Fl. antarct. 276. 1846.

Myrtus leucomyrtillus Grisebach, Syst. Bemerk. 32. 1854; Abh., Kön. Ges. Wiss. Göttingen 6:120. 1856.

Myrteola bullata Berg, Linnaea 27:394. 1856.

Eugenia humifusa R. A. Philippi, Linnaea 28:639. 1857.

Myrtus repens R. A. Philippi, Bot. Zeitung (Berlin) 15:400. 1857.

Myrteola bullata [var.] β *pentamera* Berg, Bot. Zeitung (Berlin) 15:858. 1857.

Myrteola bullata [var.] α *tetramera* Berg, Bot. Zeitung (Berlin) 15:858. 1857.

Myrteola barneoudii Berg, Linnaea 29:252. 1858.

Myrteola humifusa (R. A. Philippi) Berg, Linnaea 29:252. 1858.

Myrteola repens (R. A. Philippi) Berg, Bot. Zeitung (Berlin) 16:250–251. 1858.

Myrteola leucomyrtillus (Grisebach) Reiche, Anales Univ. Chile 98:702. 1897.

Myrteola barneoudii var. *humifusa* (R. A. Philippi) Reiche, Anales Univ. Chile 98:701. 1897.

Myrteola nummularia var. *repens* (R. A. Philippi) Reiche, Anales Univ. Chile 98:701. 1897.

Creeping subshrub or small shrub up to ca. 1 m high, glabrous or the twigs densely covered with hairs; hairs whitish to reddish brown, simple, up to ca. 0.5 mm long, usually slightly curved, antrorse, appressed or spreading; twigs glabrous

to densely pubescent, 4-angled or not, light or dark reddish brown to purplish, with age the bark becoming greyer, exfoliating in longitudinal strips. Leaves elliptic to ovate, 2.5–11 mm long, 1.5–6 mm wide, 1–1.5 times as long as wide, glabrous or with scattered hairs along the margin and midvein, often bullate below because the lower epidermis becomes detached; apex rounded, obtuse, or acute; base rounded to obtuse; petiole 0.5–1.5 mm long, ca. 0.5–0.8 mm wide glabrous or moderately pubescent; midvein impressed or about flat above, noticeable to indistinct below; lateral and marginal veins indistinct; blades coriaceous, shiny above, often dotted with glands above, drying grey green, or tinged with red. Peduncles ca. 1–9 mm long, ca. 0.3 mm wide, glabrous to pubescent, the epidermis wrinkled longitudinally or not; bracteoles foliaceous, glabrous to subglabrous, linear to elliptic, often persisting until fruit matures, 1.5–3.5 mm long, 0.5–1.5 mm wide; calyx lobes 4 or 5, linear-oblong to hemielliptic, 1.2–2.5 mm long, 0.6–1 mm wide, glabrous to subglabrous; petals 4 or 5, elliptic to obovate, ca. 3–4 mm long, white or tinged with pink, glabrous or the margin ciliate; hypanthium narrowly campanulate, 2–3 mm long, usually about 1.5 times as long as calyx lobes, glabrous to pubescent; disk ca. 2 mm across, glabrous to pubescent; style 3–4 mm long, glabrous, the stigma more or less dilated, ca. 0.2 mm wide; stamens 9–18, 4–5 mm long; anthers 0.2–0.3 mm long; ovary 2–3-locular; ovules (2)–6–12(–14) per locule. Fruit subglobose, reddish to white, tinged with pink; seeds usually several, reniform, shiny, 1.2–1.5 mm long; $2n = 44$ (Moore 1983) (Fig. 7).

DISTRIBUTION (Fig. 6).—A shrub or subshrub of *Sphagnum* bogs and other wet habitats from about 1,300 m to about sea level in south-central and southern Chile and adjacent Argentina to the tip of South America; and on the Masafuera of the Juan Fernández Islands and on the Falkland Islands. This species also grows in paramos at elevations of 2,500–3,700 m in the Andes of Venezuela, Colombia, Ecuador, Peru, and Bolivia. Various synonyms proposed for populations of northern South America are not listed here but can be consulted in my revision of *Myrteola* (Landrum 1988).

PHENOLOGY.—Flowering mainly from November to February; fruiting mainly in February and March.

LOCAL NAMES AND USES.—Daudapo, huarapo, naurapo (Muñoz 1966). The fruits are edible.

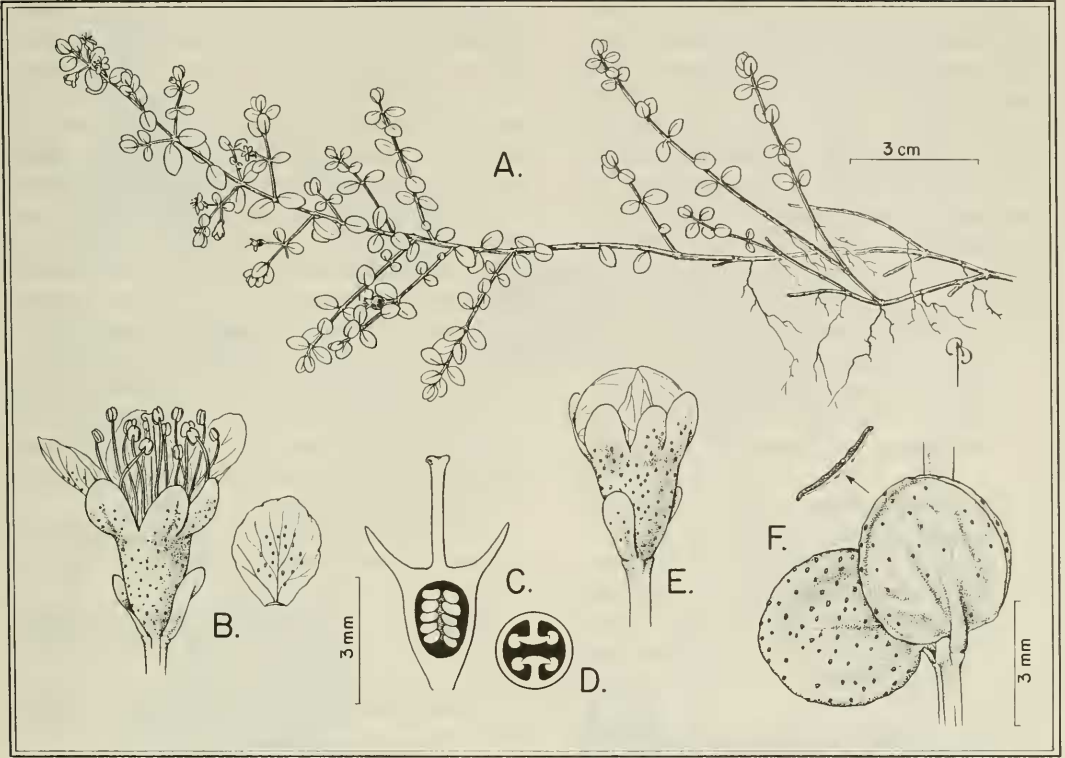


FIGURE 7. *Myrteola nummularia* (Werdermann 275 at CAS). A, habit. B, open flower and petal. C, longitudinal section of ovary. D, cross section of ovary showing incompletely fused locules. E, flower bud. F, leaves showing detached lower epidermis. Drawn by Bobbi Angell.

Myrteola nummularia is distinguished by its usually creeping habit, small leaves usually less than 1 cm long, the lower epidermis of which often becomes detached, persistent bracteoles, and small berry fruits. It is probably most likely to be confused with *Ugni* from which it differs in having erect flowers and exserted stamens.

7. *Ugni* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 21:579. 1848; Flora 31:711. 1848.

Shrubs up ca. 3 m high; hairs unicellular, simple or dibrachiate. Leaves opposite, persistent, coriaceous, mainly elliptic to lanceolate. Inflorescence a solitary, nodding flower, the peduncles not superimposed, borne in the axils of leaves or bracts; flowers usually pentamerous, less often both pentamerous and tetramerous on a single plant, the corolla campanulate, the stamens not exceeding the corolla, the filaments short, the anthers elongate, more or less sagittate, introrsely dehiscent; bracteoles persistent usually until the

fruit matures, linear to narrowly elliptic; ovary usually 3(–4)-locular, the ovules biseriate, 4-seriate, or multiseriate. Fruit a berry, the seeds few to many, shiny light brown, small, ca. 1–2 mm long; embryo C-shaped, the cotyledons almost as long as the hypocotyl, scarcely if at all folded back against themselves.

Ugni is distinguished from other genera of Chilean Myrtaceae by nodding flowers with the stamens shorter than the petals and introrsely dehiscent anthers. In fruit it is distinguished from all but *Myrteola nummularia* by having persistent bracteoles and very small (1–2 mm long), hard seeds. *Myrteola nummularia* differs in having a usually creeping habit, small leaves usually no more than 1 cm long, and a lower leaf epidermis that often becomes detached.

KEY TO THE SPECIES OF *UGNI*

1. Young twigs densely covered with reddish brown, asymmetrically dibrachiate hairs; calyx lobes hemiorbicular-triangular, about

as long as wide, the sides convex in outline; midvein raised or flat above; stamens usually more than 60; ovules biseriate; continental Chile 7.1. *U. candollei*

1. Young twigs densely to sparsely covered with whitish (rarely reddish brown), unbranched hairs; calyx lobes narrowly triangular to linear, normally longer than wide, the sides concave in outline; midvein usually impressed above; stamens usually less than 60; ovules biseriate to multiseriate
2. Bracteoles spreading to ascending; leaves strongly glandular-punctate, thick, fleshy; leaf apex obtuse to rounded; petiole more or less flat, 1–1.5 mm wide; Masatierra, Juan Fernández 7.3. *U. selkirkii*
2. Bracteoles reflexed; leaves usually not strongly glandular-punctate, nor thick, nor fleshy; leaf apex acute to acuminate; petiole usually channeled, 0.3–ca. 1 mm wide; continental and introduced to Juan Fernández and growing in disturbed sites 7.2. *U. molinae*

7.1. **Ugni candollei** (Barnéoud) Berg, Linnaea 27: 388. 1856.

Myrtus candollei Barnéoud, in Gay, Fl. Chil. 2:382. 1847.

Myrtus krausei R. A. Philippi, Linnaea 28:638. 1857.

Ugni krausei (R. A. Philippi) Berg, Bot. Zeitung (Berlin) 16: 250. 1858.

Ugni candollei forma *litoralis* Kausel, Lilloa 17:54. 1949.

Ugni candollei forma *monticola* Kausel, Lilloa 17:54. 1949.

Shrub up to ca. 2 m high; usually rusty brown pubescent on twigs and young growth; hairs asymmetrically dibrachiate to nearly simple, up to ca. 1 mm long, rusty brown or less often whitish, the longer arm directed antrorsely; twigs moderately to densely pubescent when young, the hairs sometimes appearing to be in tufts, often obscuring the light reddish brown bark, the older twigs becoming grey, with rough, stringy, or flaky bark. Leaves elliptic, ovate, lanceolate, obovate, or oblanceolate, 1–3 cm long, 0.4–1.7 cm wide, 1.5–3 times as long as wide, sparsely to moderately pubescent, more densely so along the midvein; apex acute to acuminate; base acute to rounded; petiole 1–3 mm long, ca. 0.5–0.8 mm wide, about flat above, sparsely to densely pubescent; midvein flat or raised slightly above, prominent to only visible below; lateral veins indistinct or about 10 pairs faintly visible; marginal veins equalling the laterals in prominence;

blades stiffly coriaceous, drying light grey green to reddish brown, somewhat darker above than below. Peduncles 0.5–3.5 cm long, ca. 0.5 mm wide, sparsely to densely pubescent; bracteoles narrowly elliptic to linear; calyx lobes ovate-triangular to ovate-hemiorbicular, the apex often acuminate, sparsely pubescent to glabrous without, glabrous within; petals suborbicular, 6–9 mm long, white, membranous, glabrous; hypanthium obconic to campanulate, 2–3.5 mm long, densely to sparsely pubescent; disk ca. 3 mm across, glabrous; style 3–6 mm long, glabrous; stamens 50–120, 2–3 mm long, the lanceolate, apiculate anther about ½ the length; ovary 3-locular; ovules 11–20 per locule, biseriate. Fruit subglobose, up to ca. 1 cm in diam., reddish to black; seeds numerous to few, ca. 2 mm long, the pulp of the fruit clinging to the seeds (Fig. 8A–D).

DISTRIBUTION (Fig. 9A).—A shrub of moist habitats. Known from Maule, and from Valdivia to Chiloé.

PHENOLOGY.—Flowering mainly in January and February; fruiting mainly from February to April.

LOCAL NAMES.—Murta, murta blanca, tautau, chauchau, trautrau (Muñoz 1966).

Ugni candollei is the only species of the genus with reddish brown dibrachiate hairs. The calyx lobes are usually about as long as wide, whereas in other species they are longer than broad. The only species with which it could be confused is *Ugni molinae*. *Ugni candollei* seems to be somewhat more tolerant of cool wet climates than *U. molinae*, growing either at high elevations (e.g., in the Cordillera Pelada) or farther south. The corollas of *U. candollei* seem to be somewhat more broadly campanulate than those of *U. molinae*.

The fruits of *U. candollei* are not as delicious as those of *U. molinae*, but it is an attractive shrub that would have horticultural value.

7.2. **Ugni molinae** Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 21:579. 1848; Flora 31: 711. 1848.

Myrtus ugni Molina, Sag. stor. nat. Chili, ed. 1, 161. 1782.

Eugenia ugni (Molina) W. J. Hooker et Arnott, Bot. misc. 3: 318. 1833.

Ugni poeppigii Berg, Linnaea 27:386. 1856.

Ugni philippii Berg, Linnaea 27:387. 1856.

Ugni ugni (Molina) Macloskie, Rep. Princeton Univ. Exped. Patagonia, Botany 8:602. 1905.

Ugni myrtus Macloskie, Torreya 5:198. 1905.

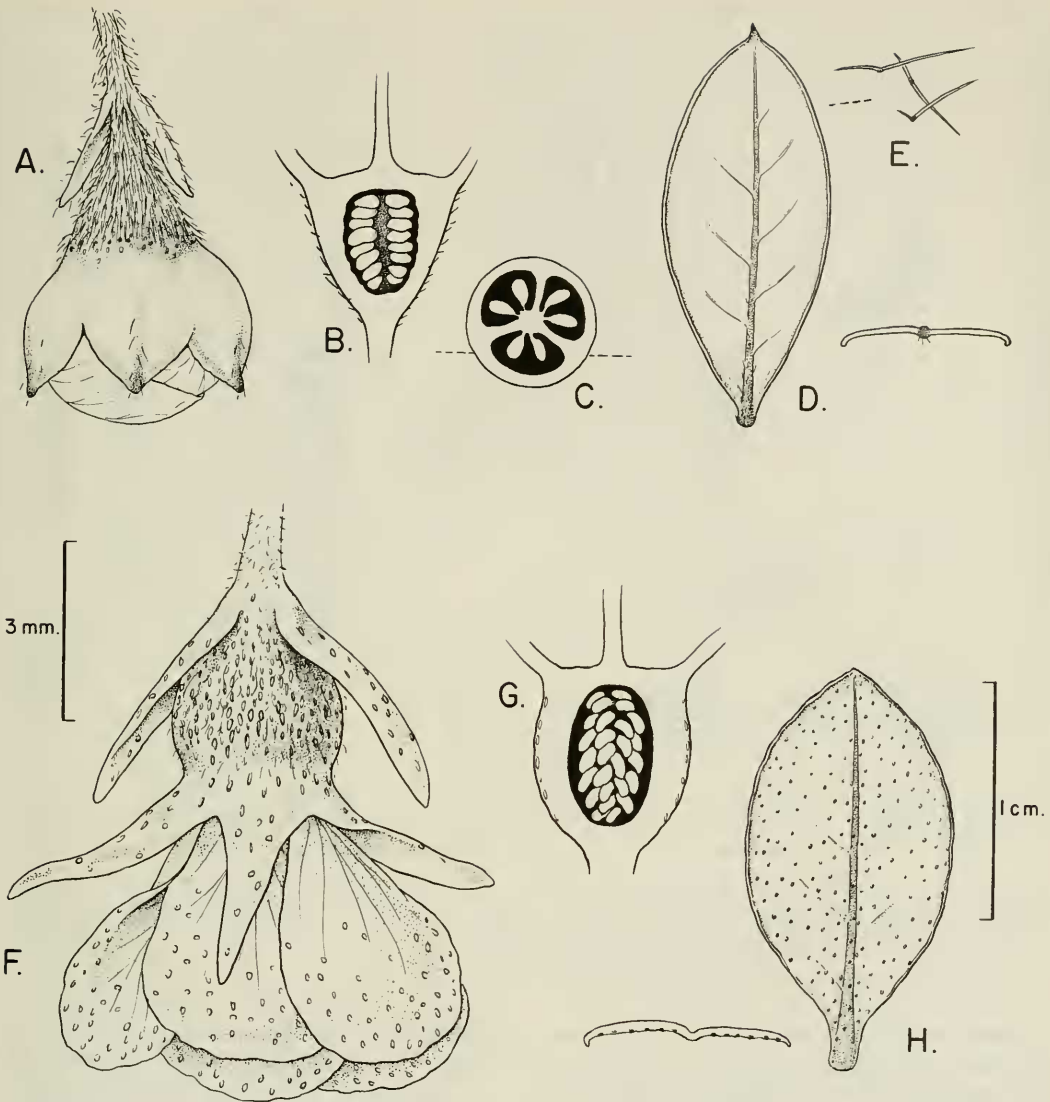


FIGURE 8. *Ugni*. *Ugni candollei* (Eyerdam 10589 at NY): A, bud. B, longitudinal section of ovary. C, cross section of ovary. D, lower leaf surface and section of leaf showing raised midvein. E, magnified view of dibrachiate hairs. *Ugni selkirkii* (Skottsberg 333 at NY): F, opening flower. G, longitudinal section of an ovary. H, lower surface of leaf and section of leaf showing impressed midvein.

Shrub up to ca. 2 m high, obscurely whitish pubescent on twigs and young growth; hairs simple, whitish, up to ca. 0.5 mm long, straight or curved, directed antorsely; twigs sparsely to moderately pubescent when young, glabrescent with age, the young bark at first light reddish brown, smooth, becoming yellowish brown to grey, flaky, stringy, or nearly smooth. Leaves ovate, lanceolate, or elliptic, 1.4–3.6 cm long, 0.8–2 cm wide, 1.5–3 times as long as wide, gla-

brous or with a few scattered hairs below; apex acute to acuminate; base acute to broadly rounded; petiole shallowly channeled, 2–4 mm long, ca. 1 mm wide, sparsely pubescent to glabrous; midvein impressed above, prominent below; lateral veins indistinct or a few pairs faintly visible; marginal veins equalling laterals in prominence; blades stiffly coriaceous, not strongly glandular, drying dark green to reddish brown above, much lighter yellow green below, the margins usually

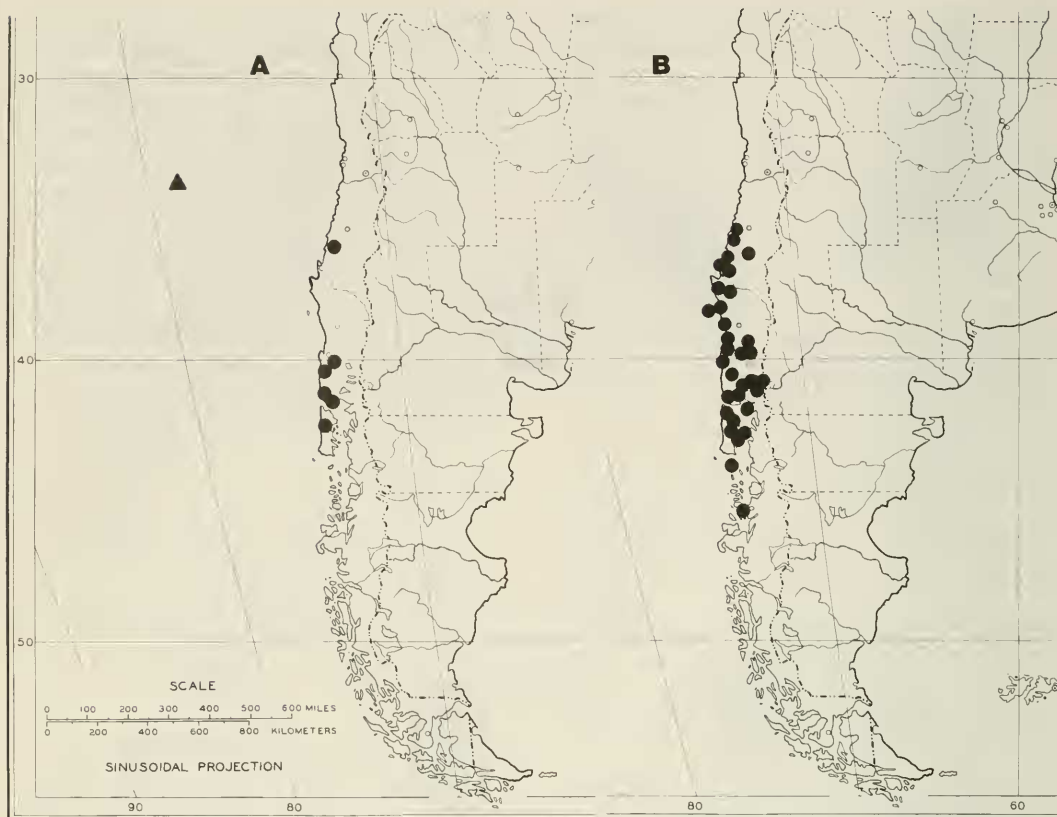


FIGURE 9. Distribution of *Ugni candollei* (A, circles), *U. selkirkii* (A, triangles), and *U. molinae* (B, circles).

slightly revolute. Peduncles 1–2.5 cm long, ca. 0.5–0.8 mm wide, normally glabrous to very sparsely pubescent, borne in the axils of leaves or bracts ca. 1–3 mm long; bracteoles linear to narrowly elliptic, 5–8 mm long, 0.5–1.5 mm wide, glabrous to very sparsely pubescent, reflexed; calyx lobes triangular, triangular-lanceolate, triangular-linear, or narrowly attenuate-triangular, 2–5 mm long, 1–2.5 mm wide, glabrous to very sparsely pubescent, the margins concave in outline; petals suborbicular, fleshy, 5–8 mm long, ca. 0.3–0.4 mm thick at base, pink when fresh, drying brown with light margins, veins not clearly visible; hypanthium subglobose to campanulate, ca. 2–3 mm long, glabrous to very sparsely pubescent; disk 2–4 mm across, glabrous; style 4–5 mm long, glabrous; stamens 40–60, 2–4 mm long, the ovate, lanceolate, or obovate anthers ca. 1–1.5 mm long, the filament flattened, ca. 0.3–0.8 mm wide; ovary 3-locular; ovules per locule 13–30, usually 4-seriate. Fruit subglobose, ca. 1 cm in diam., dark red; seeds 1.5–2 mm

long, smooth; $2n = 22$ (Sanders et al. 1983) (Fig. 10).

DISTRIBUTION (Fig. 9B).—A shrub of relatively dry to wet habitats from Linares and Maule to Chiloé in Chile, and Lago Nahuel Huapi (on the border of Río Negro and Neuquén) in Argentina.

PHENOLOGY.—Flowering mainly from December to February; fruits ripening mainly February–April.

LOCAL NAMES AND USES.—Uñi, murta, murtilla, murtillo (Muñoz 1966). The fruits of *Ugni molinae* are very delicious and commonly gathered from the wild to make marmalades and liqueurs. It is sometimes cultivated in California as an ornamental.

Ugni molinae might be confused with *U. candollei* on the continent and the differences are discussed under that species. On Masatierra it has been introduced, and there it has been mistaken for *U. selkirkii*. The two are compared directly in the key, but it is worth noting that *U.*

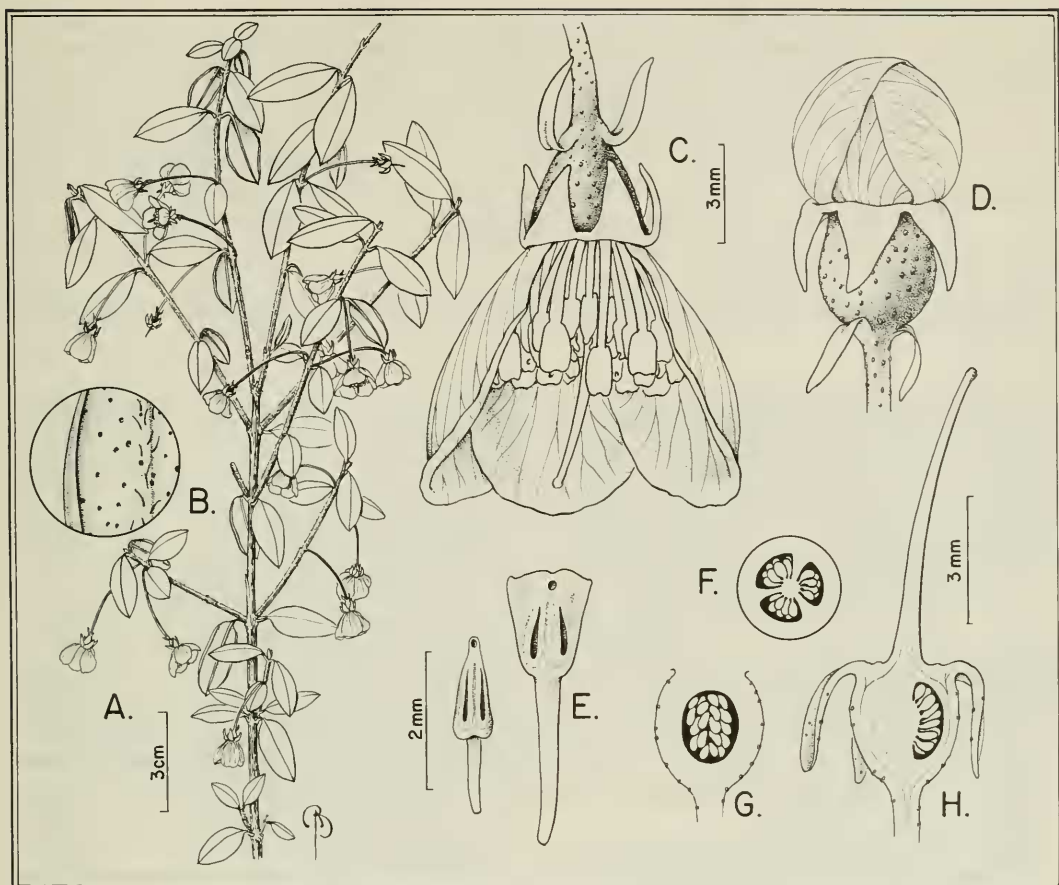


FIGURE 10. *Ugni molinae* (Werdermann 306 at CAS). A, habit. B, insert of lower leaf surface. C, open flower with two petals removed. D, flower bud. E, stamens showing anthers with terminal glands and introrsely directed slits. F, cross section of ovary. G, longitudinal section of ovary with $\frac{1}{4}$ cut away. H, longitudinal section through old flower.

molinae is a weedy species of disturbed sites on the island, whereas *U. selkirkii* grows in undisturbed areas, usually at higher elevations.

7.3. *Ugni selkirkii* (W. J. Hooker et Arnott) Berg.
Linnaea 27:392. 1856.

Eugenia selkirkii W. J. Hooker et Arnott, Bot. misc. 3:318. 1833.

Myrtus berteroi R. A. Philippi, Bot. Zeitung (Berlin) 14:644. 1856.

Ugni berteroi (R. A. Philippi) F. Philippi, Cat. pl. vasc. chil. 79. 1881.

Shrub up to ca. 3 m high, obscurely whitish pubescent on twigs and young growth; hairs simple, whitish, up to ca. 0.5 mm long, usually straight, more or less appressed, usually antrorsely directed; twigs sparsely to densely pubescent when young, glabrescent with age, the young bark

at first light reddish brown, smooth, becoming grey, scaly or rough. Leaves elliptic, suborbicular, or obovate, 0.8–2.2 cm long, 0.7–1.4 cm wide, 1.2–2(–2.3) times as long as wide, glabrous or sparsely pubescent; apex obtuse to rounded; base acuminate, acute, or rounded; petiole nearly flat above, 2–3 mm long, 1–1.5 mm wide, glabrous to sparsely pubescent; midvein impressed above, moderately prominent below; lateral and marginal veins indistinct to faintly visible; blades thickly coriaceous (probably somewhat fleshy when fresh), strongly glandular, drying dark grey green to reddish brown above, lighter yellow green or tan below, the margin revolute. Peduncles 0.7–1.5 cm long, ca. 0.8–1 mm wide, sparsely to moderately pubescent; bracteoles more or less linear, 4–7 mm long, ca. 0.8–1 mm wide, spreading or ascending, not reflexed, glabrous to sparsely pu-

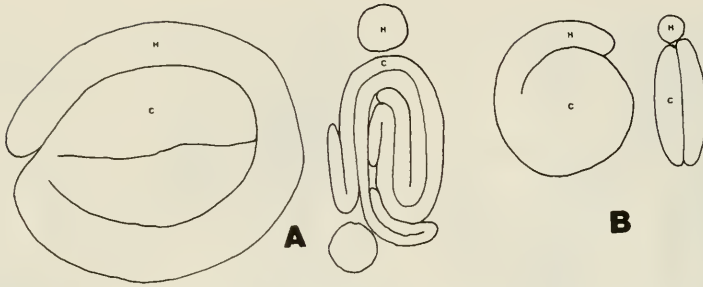


FIGURE 11. Embryos of *Myrceugenia* (A) and *Luma* (B), side views on left and sections on right. Small c = cotyledon, small h = hypocotyl.

bescent; calyx lobes oblong to linear (rarely triangular), usually with a broadened base, 2.5–4.5 mm long, 1.5–3 mm wide at base, glabrous within, glabrous to sparsely pubescent without; petals suborbicular to obovate, 4–5 mm long, glabrous, glandular; hypanthium campanulate to globose, ca. 4 mm long, sparsely pubescent; disk ca. 1.5–2.5 mm across, glabrous; style ca. 4 mm long, glabrous; stamens 30–40, 1.5–3 mm long, the anther ca. 1 mm long; ovary 3(–4)-locular; ovules 23–41 per locule, multiseriate. Fruit subglobose, ca. 1 cm in diam.; seeds ca. 1 mm long; $2n = 44$ (Sanders et al. 1983) (Fig. 8F–H).

DISTRIBUTION (Fig. 9A).—Known only from Masatierra, Juan Fernández.

PHENOLOGY.—Flowering mainly from January to March; fruits probably ripening in April and May.

Ugni selkirkii might only be confused with *U. molinae*. They are compared directly in the key and in the discussion of that species.

Myrciinae Berg, 1855

8. ***Myrceugenia*** Berg, *Linnaea* 27:5 (in key). 1855; *Linnaea* 27:131. 1856.

Myrcia subgen. *Myrceugenia* (Berg) Kiaerskou, Enum. Myrt. bras. 115. 1893.

Nothomyrcia Kausel, *Lilloa* 13:148. 1948 ("1947").

Trees to ca. 10 m high or much-branched shrubs less than 1 m high; hairs simple or dibrachiote, unicellular. Leaves opposite (rarely ternate or subopposite), variously shaped, usually not strongly aromatic. Inflorescence axillary,

uniflorous or a dichasium with 1–3 levels of bifurcation, the peduncles borne in the axils of leaves or small bracts, solitary or superimposed in rows of 2–4, the lateral branches of the dichasia often superimposed; bracteoles normally persisting until the fruit matures, rarely (in *M. fernandeziana*) caducous at anthesis; ovary 2–4-locular, the ovules 2 to about 20 per locule, biseriate. Fruit a berry, yellow, orange, reddish, or dark purple, the seeds usually 1–5, the testa membranous; embryo globose, the cotyledons thin, membranous, folded into a bundle, the hypocotyl about as long as the cotyledons, horseshoe-shaped, encircling the cotyledons (Fig. 11A); $2n = 22$ (Landrum 1981; Sanders et al. 1983).

Myrceugenia can be distinguished from other genera of Chilean Myrtaceae when in fruit by its embryo and usually when in flower by its combination of tetramerous flowers and persistent, reduced, clasping bracteoles. *Myrceugenia obtusa* has foliaceous bracteoles, and *M. fernandeziana* has bracteoles that are caducous at anthesis.

There are 40 species of *Myrceugenia* (Landrum 1981, 1984), 14 of which grow in Chile and adjacent Argentina. The rest grow in southeastern Brazil, Paraguay, Uruguay, and northeastern Argentina. *Myrceugenia ovata* has varieties in both eastern and western South America.

Local names for species of *Myrceugenia* are probably not consistently applied in Chile except for the more easily recognized species, but luma, arrayán, peta, pitra, petra, and diminutives of these are often used.

KEY TO THE SPECIES OF *MYRCEUGENIA*

1. Bracteoles scarious, caducous at anthesis; hairs simple; midvein not impressed; Masatierra, Juan Fernández 8.5. *M. fernandeziana*

1. Bracteoles not scarious, not caducous at anthesis, usually persisting until the fruit matures; at least some hairs dibrachiate; midvein usually impressed; not on Masatierra
2. Leaves less than 2 cm long, ca. 0.2–0.5 mm wide, densely covered with reddish brown appressed dibrachiate hairs beneath; coastal shrub of central Chile 8.13. *M. rufa*
2. Leaves larger and/or not covered with reddish brown dibrachiate hairs beneath
3. Dichasial inflorescences present
 4. Twigs and flowers yellowish lanate; Masafuera, Juan Fernández 8.14. *M. schulzei*
 4. Twigs and flowers not yellowish lanate; mainland
 5. Leaves 1–2.5 times as long as wide; dichasia usually with more than 3 flowers; twigs not reddish; bracteoles usually less than 0.5 mm wide 8.4. *M. exsucca*
 5. Leaves 3–15 times as long as wide; dichasia usually with no more than 3 flowers; twigs reddish; bracteoles usually 0.5–1 mm wide 8.6. *M. lanceolata*
3. Dichasial inflorescences not present
 6. Bracteoles leaflike, petiolate, linear, oblong, elliptic, or spatulate, 2–6 mm long, 0.5–2.5 mm wide, not clasping the hypanthium; leaf apex blunt, obtuse, or rounded
 7. Hypanthium 1–2 mm long; peduncles solitary, 0.4–0.6 mm wide; hairs a mixture of simple and dibrachiate; leaf margins not revolute 8.8. *M. obtusa*
 7. Hypanthium 2.5–4 mm long; peduncles often in pairs, 1–1.5 mm wide; hairs all symmetrically dibrachiate; leaf margins revolute 8.3. *M. correifolia*
 6. Bracteoles not leaflike, generally ovate to lanceolate, clasping the hypanthium; leaf apex usually acute
 8. Peduncles glabrous or with only scattered hairs
 9. Twigs densely pubescent; leaves 1–2.6 cm long, 0.3–0.7 cm wide; peduncles solitary; lower elevations 8.10. *M. parvifolia*
 9. Twigs glabrous or nearly so; leaves 1.3–5 cm long, 0.5–2.5 cm wide; peduncles often in pairs; mainly above 700 m 8.1. *M. chrysocarpa*
 8. Peduncles pubescent, the hairs sometimes very small
 10. Leaves linear, narrowly oblong, or oblanceolate, mainly 3–15 times as long as wide
 11. Leaves oblanceolate to linear; twigs reddish; hypanthium 1.5–2 times as long as wide, usually slightly contracted just below the calyx lobes 8.6. *M. lanceolata*
 11. Leaves elliptic to linear; twigs not reddish; hypanthium usually about as wide as or wider than long, not contracted just below the calyx lobes
 12. Hypanthium 1.5–2 mm long; leaves strongly discolorous, dark green above, light green below; stamens about 100–150; calyx lobes about as long as or shorter than the hypanthium 8.11. *M. pinifolia*
 12. Hypanthium about 1 mm long or shorter; leaves more or less colorous, light grey green; stamens about 60–100; calyx lobes about 1.5 times as long as the hypanthium 8.7. *M. leptospermoides*
 10. Leaves usually elliptic, ovate, obovate, or oblong, mainly less than 3 times as long as wide
 13. Twigs and flowers yellowish lanate; essentially all hairs symmetrically dibrachiate
 14. Leaves mainly 1–2 cm long (shade leaves occasionally longer), often verticillate, the apex broadly rounded; calyx lobes not greenish, coriaceous, more or less acute; mainland 8.2. *M. colchaguensis*
 14. Leaves 1.5–5(–6) cm long, some normally well over 2 cm long, not verticillate, the apex often acute or acuminate; calyx lobes greenish, rounded or blunt, membranous; Masafuera, Juan Fernández 8.14. *M. schulzei*
 13. Twigs and flowers not yellowish lanate; hairs symmetrically dibrachiate or not

15. Peduncles densely covered with reddish brown hairs
 16. Leaves mainly 1–3 cm long; hairs a mixture of simple and asymmetrically dibrachiate; leaf margins not revolute; bracteoles 0.5–2 mm long; coast and interior from Linares to Chiloé 8.9. *M. ovata*
 16. Leaves often exceeding 3 cm long; hairs appressed, all symmetrically dibrachiate; leaf margins strongly revolute; bracteoles 3–8 mm long; coast from Curicó to Coquimbo 8.3. *M. correfolia*
15. Peduncles sparsely pubescent or if densely pubescent, the hairs whitish
 17. Hypanthium (1.5–)2–4 mm long, densely covered with minute appressed, whitish hairs; peduncles ca. 1 mm wide, usually densely glandular; leaves almost all acuminate at both apex and base, mainly 3–8 cm long; generally at altitudes below 700 m 8.12. *M. planipes*
 17. Hypanthium 1–2 mm long, glabrous to densely pubescent, the hairs whitish, yellowish, or reddish brown; peduncles 0.5–1 mm wide, with few or no glands; leaves often rounded or blunt at apex or base, often all under 3 cm long; generally at altitudes of 700–1,000 m 8.1. *M. chrysocarpa*

8.1. *Myrceugenia chrysocarpa* (Berg) Kausel,
Revisión de las Mirtáceas Chilenas 2. 1940;
Revista Argent. Agron. 9:58. 1942.

Eugenia chrysocarpa Berg, Linnaea 27:168. 1856.

Eugenia philippi Berg, Linnaea 27:145. 1856.

Eugenia buxifolia R. A. Philippi, Linnaea 28:640. 1857.

Eugenia patagonica R. A. Philippi, Linnaea 33:72. 1864.

Eugenia petiolata R. A. Philippi, Anales Univ. Chile 84:757. 1893.

Myrceugenia buxifolia (R. A. Philippi) Reiche, Anales Univ. Chile 98:712. 1897; Fl. Chile 2:296. 1898.

Luma chrysocarpa (Berg) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:524. 1941.

Luma philippi (Berg) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:523. 1941.

Shrub up to ca. 3 m high, without glands or at least not conspicuously glandular; hairs reddish brown to whitish, mainly appressed, dibrachiate; twigs moderately pubescent to glabrous when young, soon glabrescent. Leaves glabrous or with a few scattered, inconspicuous hairs, usually elliptic, ovate, or lanceolate, less often obovate or oblanceolate, 1.3–5(–6) cm long, 0.5–2.5 cm wide, 1.5–4.5(–5.8) times as long as wide; apex acute, obtuse, or rounded; base obtuse, acute, or cuculate; petiole channeled, 3–6 mm long, 0.5–1 mm thick, glabrous to very sparsely pubescent; midvein impressed for entire length or nearly so above, moderately prominent below, at least proximally; lateral veins indistinct or up to ca. 15 pairs faintly visible; marginal veins equalling laterals in prominence; blades coriaceous, light

grey green, yellow green to somewhat olive green above, light grey green or yellow green below, often concolorous, both surfaces dull. Peduncles uniflorous, flattened, 3–16 mm long, 0.6–1 mm wide, glabrous to sparsely pubescent, solitary or in pairs in the leaf axils; bracteoles lanceolate, 1.3–2.7 mm long, 0.6–1.4 mm wide, 1.9–2.7 times as long as wide, coriaceous, clasping the hypanthium, glabrous within, glabrous or with scattered hairs without; calyx lobes ovate to ovate-oblong, 1.7–3.2 mm long, 1.5–3.4 mm wide, 0.8–1.4 times as long as wide, subcoriaceous, glabrous to very inconspicuously and sparsely pubescent within and without, concave; petals glabrous, white to tan when dry, suborbicular, 2–4 mm in diam.; hypanthium obconic, the walls often slightly concave, 1.3–2 mm long, densely pubescent to nearly glabrous; disk 2–3 mm across, glabrous or with occasional hairs; stamens 70–150, 3–10 mm long; anthers slightly elongate, 0.3–0.5 mm long; style glabrous, 7–10 mm long; ovary 2–3-locular; ovules 3–10 per locule. Fruit globose, 7–12 mm in diam., orange brown; seeds 1–5 in fruits seen, oblong, ca. 4–5 mm long (Fig. 12H).

DISTRIBUTION (Fig. 13A).—In mountainous areas, usually above 700 m, usually in forests of *Nothofagus dombeyi*, from Malleco to Chiloé in Chile and in the Andes of Neuquén, Río Negro, and Chubut in Argentina.

PHENOLOGY.—Flowering in February and

March. Fruits mature from November to February.

Myrceugenia chrysocarpa is distinguished by leaves that are essentially glabrous and concolorous. Peduncles that are glabrous or sparsely pubescent, uniflorous and often superimposed; and a mountainous habitat, usually above 700 m. It is probably the most cold-tolerant species of Myrtaceae in Chile. It is occasionally confused with *M. planipes*, with which it is compared directly in lead 17 of the key.

8.2. *Myrceugenia colchaguensis* (R. A. Philippi) Navas, Bol. Mus. Nac. Hist. Nat. 29:230. 1970.

Eugenia colchaguensis R. A. Philippi, Linnaea 33:72. 1864.
Myrceugenia malvillana Kausel, Lilloa 17:51. 1949.

Shrub 2–4 m high; hairs golden brown to yellowish brown, more or less symmetrically dibrachiate, twisted; twigs densely lanate when young, glabrescent with age, strongly flattened at the nodes. Leaves opposite or verticillate, densely lanate below when young, less densely so to glabrous above when young, glabrescent on both surfaces with age, elliptic to obovate, 0.7–2(–3) cm long, 0.4–1.2(–1.5) cm wide, 1.4–2 times as long as wide; apex obtuse to rounded; base rounded to acute; petiole 1–2 mm long, ca. 1 mm thick, densely lanate when young, glabrescent with age, slightly channeled; midvein recessed proximally or not at all above, prominent proximally, indistinct distally below; lateral and marginal veins indistinct; blades light yellow green to grey green, lustrous or dull above, lighter beneath, coriaceous to subcoriaceous. Peduncles uniflorous, flattened, 0.8–1.7 cm long, ca. 1 mm wide, densely lanate, solitary or in pairs in the leaf axils; bracteoles lanceolate, 1.5–2.5 mm long, 0.7–1 mm wide, 2–2.8 times as long as wide, densely lanate within and without, subcoriaceous, clasping the hypanthium; calyx lobes ovate to broadly triangular, 2–3 mm long, 2–3.5 mm wide, 0.7–1.2(–1.4) times as long as wide, densely lanate distally to glabrous proximally within, densely lanate without, coriaceous, usually somewhat concave; hypanthium densely lanate, 1.2–2 mm long; disk 2–3 mm across, sparsely covered with hairs; style 5–9 mm long, sparsely pubescent to glabrous; stamens ca. 180–240, 5–8 mm long; anthers ca. 0.5 mm long when dry; petals concave, more or less orbicular, ca. 3–5 mm in diam.;

ovary usually 3-locular; ovules 6–12 per locule; mature fruit yellow orange, ca. 7 mm in diam. (Fig. 12K).

DISTRIBUTION (Fig. 13B).—A large shrub known from very few collections made from Valparaíso to Malleco. Four new localities have come to my attention since the publication of my monograph of *Myrceugenia* (Landrum 1981), viz., Arauco: Paicaví, Jan 1929 (fl), *Claude-Joseph* 5953 (US). Cautín: Nueva Imperial, Almagro, 50 m, Dec 1943 (fl), *Montero* 4794 (CONC). Curicó: Potrero Grande, 21 Jan 1927 (fl), *Barros* 1899 (CONC). Valparaíso: Quilpué, Hacienda Las Palmas, Cerro Chivato, 1 Nov 1984 (fr), *Zollner and Ruiz* 1 (ASU).

PHENOLOGY.—Flowering occurs in January and February. Fruits probably mature in spring months of October to December.

Myrceugenia colchaguensis can be distinguished from other species of Chilean Myrtaceae by a combination of: calyx lobes that are densely lanate without; yellowish, symmetrically dibrachiate, twisted hairs; small leaves; and uniflorous peduncles.

8.3. *Myrceugenia correifolia* (W. J. Hooker et Arnott) Berg, Linnaea 30:670. 1861.

Eugenia correifolia W. J. Hooker et Arnott, Bot. misc. 3:319. 1833.

Eugenia maritima Barnéoud, in Gay, Fl. Chil. 2:391. 1847.
Luma correifolia (J. W. Hooker et Arnott) Gray, U.S. Expl. Exped., Phan. 542. 1854.

Eugenia thalassaia Berg, Linnaea 27:179. 1856.

Myrceugenia johowi Gusinde, Anales Univ. Chile 104:307. 1917.

Myrceugenia thalassaia (Berg) Gusinde ex Fuentes, Bol. Mus. Nac. Hist. Nat. 13:108. 1930.

Myrceugenia maritima (Barnéoud) Kausel, Revisión de las Mirtáceas Chilenas 2. 1940.

Tree or shrub up to 4 m tall or perhaps taller; hairs reddish brown to whitish grey, appressed, dibrachiate, about symmetric; twigs densely pubescent when young, glabrescent with age. Leaves sparsely to densely pubescent below, glabrous to densely pubescent above, oval to elliptic, 2–7.5 cm long, 1–4.5 cm wide, 1.5–2.3 times as long as wide, the margins revolute, the whole leaf sometimes curling in dried specimens; apex broadly rounded or obtuse, less often acute; base rounded to broadly cuneate; petiole densely to sparsely pubescent, 2–5 mm long, 1–1.5 mm thick, scarcely channeled; midvein slightly recessed proximally to not at all distally, more pu-

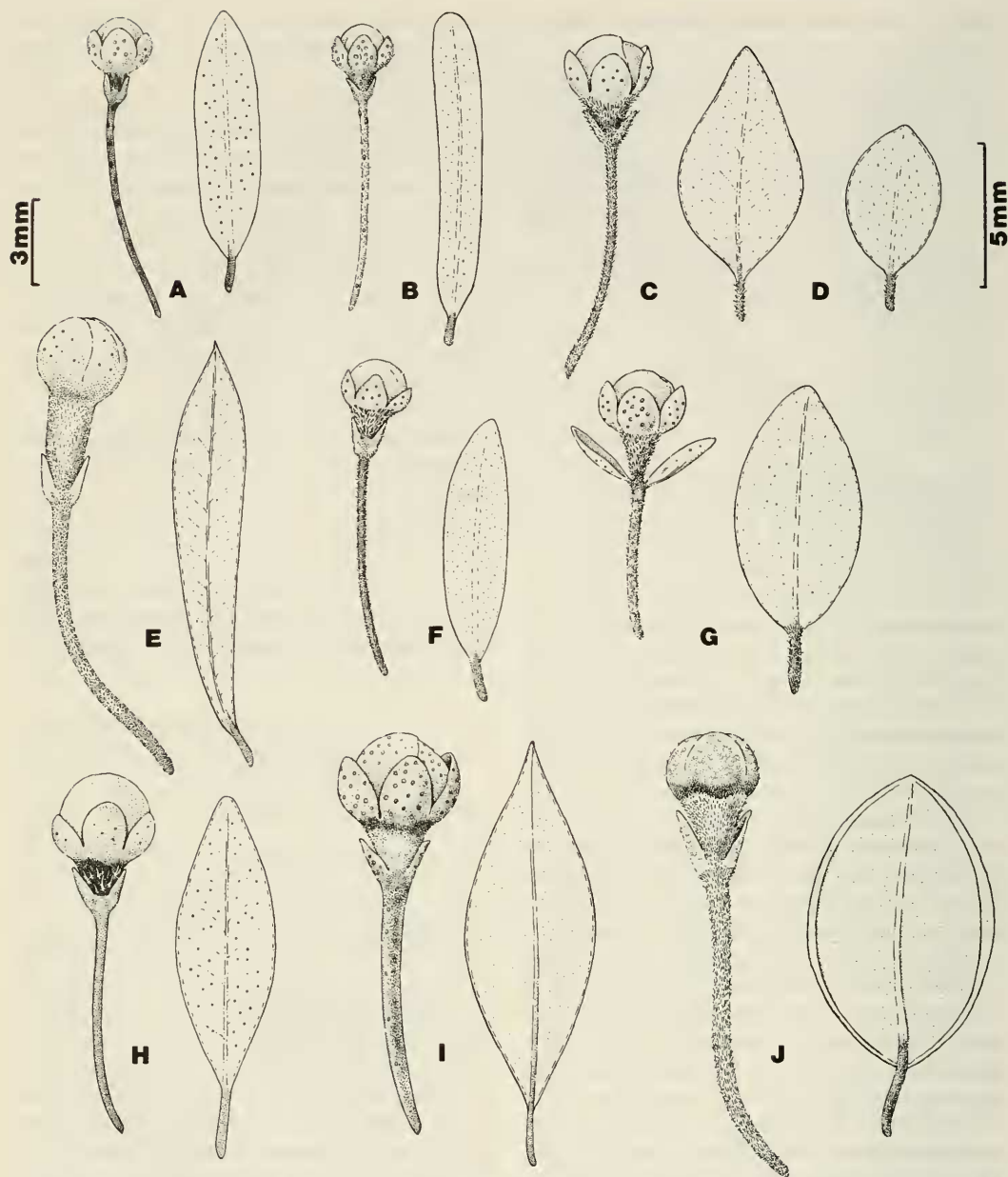
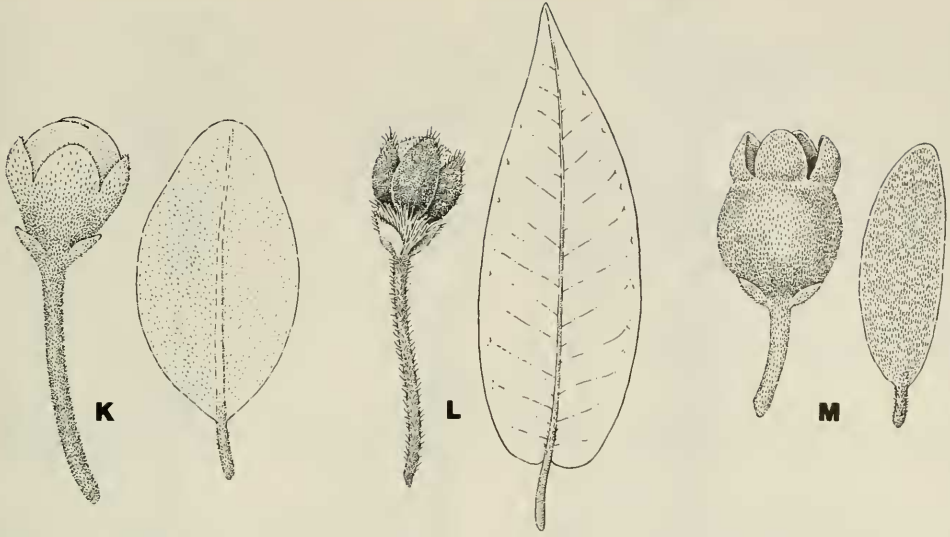


FIGURE 12. *Myrceugenia*. A, *M. parvifolia* (Hollermayer 1200 at CAS). B, *M. leptospermoides* (Aravena 18 at UC). C, *M. ovata* var. *ovata* (West 4883 at UC). D, *M. ovata* var. *nannophylla* (Landrum 3176 at MICH). E, *M. lanceolata* (Reiche 17 at CAS). F, *M. pinifolia* (Landrum 3090 at MICH). G, *M. obtusa* (Morrison 16731 at UC). H, *M. chrysocarpa* (Landrum 4376 at NY). I, *M. planipes* (bud from DS-30360, leaf from Werdermann 1208 at CAS). J, *M. correifolia* (Werdermann 900 at CAS). K, *M. colchaguensis* (Claude Joseph 5953 at US). L, *M. fernandeziana* (Pisano 1421 at UC). M, *M. rufa* (Bertero 1170 at UC). Scale on left for flowers; scale on right for leaves. Relatively small leaves were used in this drawing for C, E, H, I, J, K and L. Drawn by Terry Bell.



bescent than surrounding blade above, prominent below; lateral veins indistinguishable or up to ca. 10 pairs barely visible; marginal veins equalling laterals; blades dull, light yellow green to light bluish green above, grey green to yellow green below, coriaceous. Peduncles uniflorous, flattened, 1–3.5 cm long, 1–1.5 mm wide, densely pubescent, solitary or in pairs in the leaf axils; bracteoles lanceolate, 3–7 mm long, 1–2 mm wide, 2.5–3.5 times as long as wide, coriaceous, glabrous to densely pubescent within, sparsely to densely pubescent without, clasping the hypanthium, becoming reflexed distally with age (rarely leaflike and not clasping the hypanthium); calyx lobes concave, coriaceous, very sparsely pubescent to glabrous within and without, conspicuously glandular, 2.5–4 mm long, 2.9–4.5 mm wide, 0.7–1 times as long as wide; hypanthium obconic, 2.5–4 mm long, densely pubescent; disk 3–4 mm across, sparsely pubescent; style 0.5–1 cm long, glabrous; stamens 130–200, 4–8 mm long; anthers 0.5–0.9 mm long when dry; petals suborbicular, concave, ca. 4–6 mm in diam., white to cream-colored; ovary 3–4-locular, the ovary wall thick, glandular; ovules 6–12 per locule. Fruit dark amber brown to black, glandular, 0.7–1 cm long, 0.4–0.8 cm wide, sparsely puberulent; seeds usually 3–4, 6–8 mm long, more or less oblong (Fig. 12J).

DISTRIBUTION (Fig. 13C).—A shrub or small tree growing in coastal habitats from Coquimbo to Curicó.

PHENOLOGY.—Flowering from August to February. Fruits mature within a few months.

Myrceugenia correifolia is distinguished from other species of Chilean Myrtaceae by a combination of relatively large flowers, large leaves, and revolute leaf margins. It is occasionally confused with *M. exsucca* from which it differs in having a uniflorous inflorescence, bracteoles over 2 mm long, and strictly dibrachiate hairs.

8.4. *Myrceugenia exsucca* (A. P. de Candolle) Berg, *Linnaea* 30:671. 1861.

Eugenia exsucca A. P. de Candolle, *Prodr.* 3:278. 1828.

?*Eugenia temu* W. J. Hooker et Arnott, *Bot. Beechey Voy.* 56. 1832.

Eugenia multiflora W. J. Hooker et Arnott, *Bot. misc.* 3:322. 1833.

?*Luma temu* (W. J. Hooker et Arnott) Gray, *U.S. Expl. Exped., Phan.* 539. 1854.

Myrceugenia lechleriana Berg, *Linnaea* 27:133. 1856.

Myrceugenia camphorata Berg, *Linnaea* 27:134. 1856.

Eugenia exsucca [var.] *α peruviana* Berg, *Linnaea* 27:255. 1856.

Eugenia exsucca [var.] *β patagua* Berg, *Linnaea* 27:256. 1856.

?*Eugenia exsucca* [var.] *γ temu* (W. J. Hooker et Arnott) Berg, *Linnaea* 27:256. 1856.

?*Eugenia exsucca* [var.] *δ apiculata* Berg, *Linnaea* 27:257. 1856.

Eugenia pitra Berg, *Linnaea* 27:264. 1856.

Eugenia corralensis Philippi, *Linnaea* 33:72. 1864.

Myrceugenia multiflora (W. J. Hooker et Arnott) Kausel, *Revisión de las Mirtáceas Chilenas* 2. 1940; *Revista Argent. Agron.* 9:63. 1942.

Luma exsucca (A. P. de Candolle) Burret, *Notizbl. Bot. Gart. Berlin-Dahlem* 15:525. 1941.

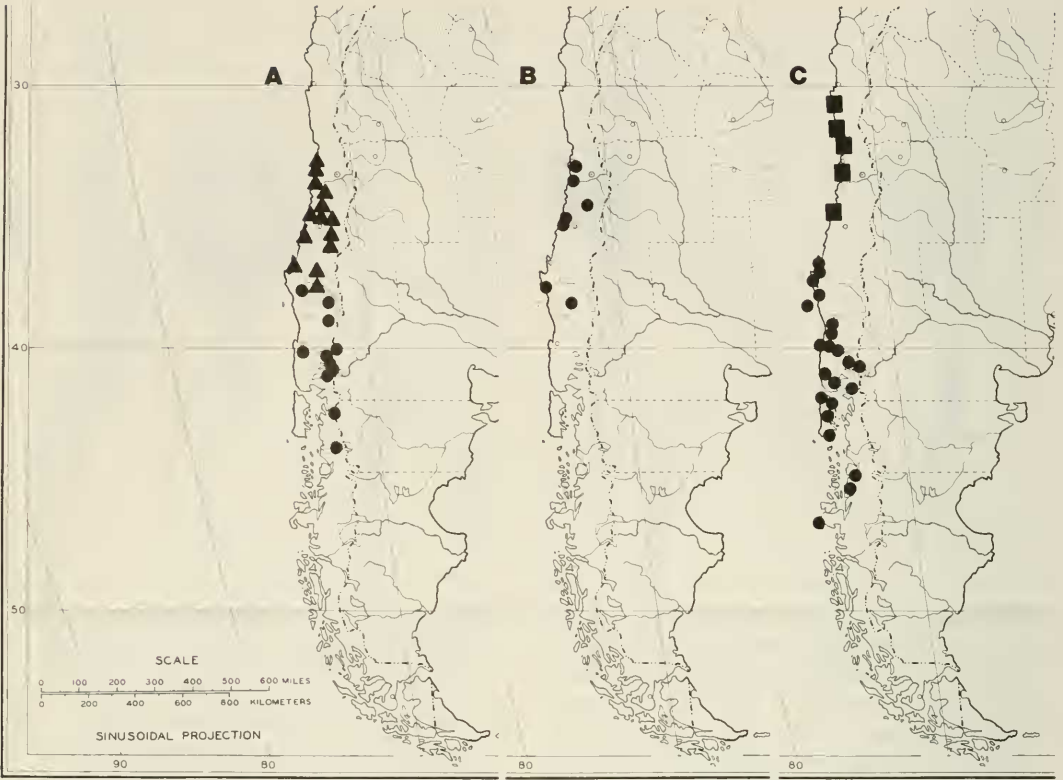


FIGURE 13. Distribution of *Myrceugenia chrysocarpa* (A, circles), *M. lanceolata* (A, triangles), *M. colchaguensis* (B, circles), *M. correifolia* (C, squares), and *M. planipes* (C, circles).

Luma pitra (Berg) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:525. 1941.
Luma corralensis (R. A. Philippi) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:525. 1941.

Tree up to ca. 12 m high, the bark light grey, rough with longitudinal fissures; hairs reddish brown to yellowish brown, simple or asymmetrically dibrachiate; twigs densely pubescent when young, the hairs more or less spreading, gradually deciduous or persisting until the young bark falls. Leaves suborbicular, elliptic, elliptic-obovate, or elliptic-ovate (1-)2-7.5(-12.5) cm long, (0.8-)1.5-3.5(-5) cm wide, 1.2-2.4 times as long as wide, sparsely puberulent to glabrous above, moderately to sparsely pubescent below when young, glabrescent with age; apex and base acute to rounded or less often acuminate; petiole unchanneled or weakly channeled, 1.5-6 mm long, 1-2 mm thick, sparsely to densely pubescent; midvein impressed for entire length or only proximally above, prominent below, often slightly excurrent; lateral veins indistinct or up to ca. 20 pairs visible; marginal veins equalling laterals

in prominence or less prominent; blades coriaceous to subcoriaceous, dark or light grey green to reddish brown above, lightly yellow green to reddish tan below, usually strongly discolorous, the surfaces dull. Inflorescence a solitary flower, a dichasium, or less often a bracteate shoot, the multiflorous inflorescences 3-10 cm long, bearing up to ca. 10 flowers. Peduncles solitary or up to 3 in a row in the axils of leaves and bracts, flattened, 0.5-1 mm wide, densely pubescent; bracteoles lanceolate, 1-2 mm long, 0.3-0.5 mm wide, 2-5 times as long as wide, sparsely to densely pubescent within and without, subcoriaceous; calyx lobes ovate to ovate-oblong, concave, 1.6-2.8 mm long, 1.7-2.7 mm wide, 0.7-1.2 times as long as wide, subcoriaceous, sparsely to densely pubescent within and without, strongly reflexed after flowering; hypanthium obconic to subglobose, 2-4 mm long, densely pubescent; disk 2.5-3 mm across, densely to sparsely pubescent, slightly recessed in the center; stamens 170-275, 3-10 mm long; anthers 0.3-0.5 mm long; petals glabrous to sparsely pubescent, sub-

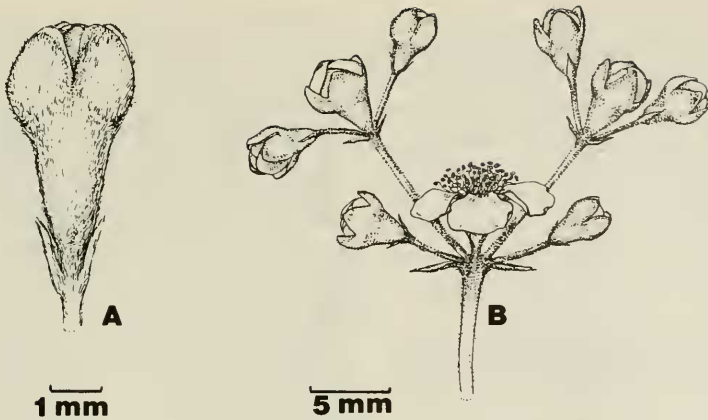


FIGURE 14. Flower and inflorescences of *Myrceugenia exsucca* (Maldonado 21 at NY). A, flower showing two persistent bracteoles subtending the hypanthium. B, a dichasial inflorescence with superimposed branches. Drawn by Karen Douthit.

orbicular, 2–4 mm in diam., white to tan when dry; style 5–8 mm long, sparsely pubescent; ovary 2–4-locular; ovules 7–13 per locule. Fruit globose, about 6–8 mm in diam., yellow brown to orange brown when dry; seeds 2–9, subglobose to oblong, 3–5 mm long (Fig. 14).

DISTRIBUTION (Fig. 15B).—A common tree of relatively wet habitats (edges of lakes, marshes, along slow-moving rivers) from Coquimbo to Chiloé in Chile and from the Andes of Neuquén, Río Negro, and Chubut in Argentina.

PHENOLOGY.—Flowering from January to March. Fruits seem to mature from September to November.

Myrceugenia exsucca is distinguished by its dichasial inflorescences, persistent bracteoles, and broad, usually subelliptic leaves. It hybridizes with *M. lanceolata* and *M. ovata* var. *nannophylla* (Landrum 1975, 1981). It is occasionally confused with *B. cruckshanksii*, which has a similar inflorescence structure, leaf size and shape, and habitat preference. *Myrceugenia exsucca* can be distinguished from that species by its persistent bracteoles, leaf apices that are not emarginate, and rough-fissured bark.

8.5. *Myrceugenia fernandeziana* (W. J. Hooker et Arnott) Johow, *Estud. Fl. Juan Fernández* 94. 1896.

Myrtus fernandeziana W. J. Hooker et Arnott, *Bot. misc.* 3: 316. 1833.
Eugenia lumilla R. A. Philippi, *Bot. Zeitung (Berlin)* 14:643. 1856.
Eugenia fernandeziana (W. J. Hooker et Arnott) Barnéoud in Gay, *Fl. Chil.* 2:392. 1847.

Myrceugenia luma Berg, *Linnaea* 30:671. 1860.
Luma fernandeziana (W. J. Hooker et Arnott) Burret, *Notizbl. Bot. Gart. Berlin-Dahlem* 15:526. 1941.
Nothomyrcia fernandeziana (W. J. Hooker et Arnott) Kausel, *Lilloa* 13:148. 1948 (“1947”).

Tree up to 25 m high, the bark smooth, mottled; hairs simple, usually spreading, whitish; twigs moderately to sparsely pubescent when young, glabrescent with age. Leaves very sparsely pubescent to glabrous, ovate to lanceolate, 2.8–7.3 cm long, 1.2–2.3 cm wide, 2–4 times as long as wide; apex acute to acuminate, the tip usually blunt; base slightly cordate to narrowly rounded; petiole 2–5 mm long, moderately pubescent to glabrous when young, losing any pubescence with age, often rough with cracks and wrinkles, barely channeled, reddish brown to blackish; midvein about flush with blade to slightly raised, prominent, with longitudinal wrinkles above and below; lateral veins prominent, up to about 40 pairs visible, the reticulate secondary veins numerous; marginal veins equalling laterals in prominence, arching slightly between them; blades light yellow green to darker grey green above (rarely drying reddish brown), the same color or slightly lighter below, coriaceous; flowers mainly aggregated together in bracteate shoots of 4–12, the shoots 1–3 cm long, either solitary or seriate at the nodes, terminating in a vegetative bud or flower. Peduncles solitary or in pairs in the axils of bracts (perhaps also occasionally in the axils of leaves), 2–11 mm long, ca. 0.5 mm wide, densely to sparsely pubescent; bracts and bracteoles ovate, 1–2.5 mm long, ca. 1 mm wide, membranous, caducous at anthesis or before, sparsely pubes-

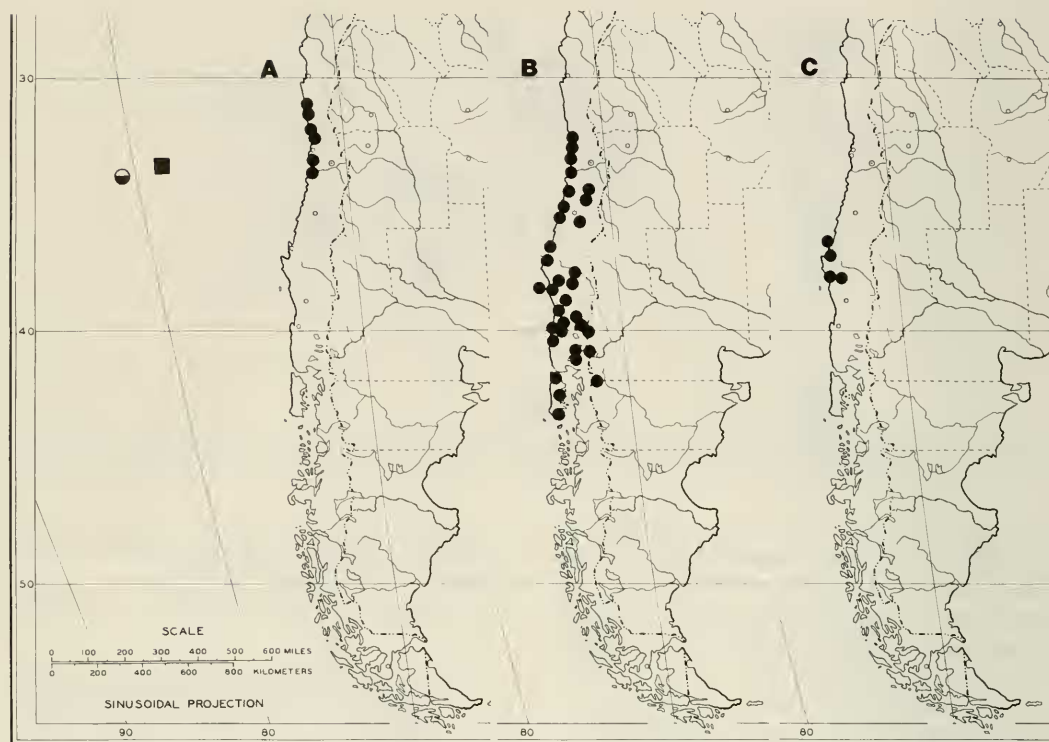


FIGURE 15. Distribution of *Myrceugenia fernandeziana* (A, square), *M. schulzei* (A, half circle), *M. rufa* (A, whole circle), *M. exsucca* (B, circle), and *M. leptospermoides* (C, circle).

cent to glabrous within and without, some bracts serving as bud scales; calyx lobes ovate, strongly concave, more or less acute, 1.6–4 mm long, 1.6–3.5 mm wide, 1–1.4 times as long as wide, membranous to slightly fleshy, sparsely pubescent without, sparsely to densely pubescent within; hypanthium obconic, densely pubescent, 1.5–3 mm long; disk 2–3 mm across, moderately to densely pubescent, sometimes becoming slightly convex during maturation; style densely to sparsely pubescent, 6–9 mm long; stamens 40–80, 5–10 mm long; anthers 0.5–0.8 mm long when dry; petals more or less orbicular to slightly elongate, 2–4 mm in diam.; ovary 2–3-locular; ovules (1)–3–7 per locule. Fruit orange when fresh, darkening when dry, few seeded (Fig. 12L).

DISTRIBUTION (Fig. 15A).—Known only from Masatierra, of the Juan Fernández Islands, where it is perhaps the most common tree.

PHENOLOGY.—Flowering from August to December. Fruits probably mature in July and August.

LOCAL NAME AND USE.—Luma. The wood has been used as a building material in the past.

Myrceugenia fernandeziana is distinguished by its large, usually lanceolate leaves with the midveins not impressed and somewhat wrinkled.

8.6. *Myrceugenia lanceolata* (Jussieu ex Jaume Saint-Hilaire) Kausel, Lilloa 13:135. 1948 ("1947").

Myrtus lanceolata Jussieu ex Jaume Saint-Hilaire, in Duhamel, Traité arbr. arbust., ed. 2, 1:208. 1800–1803.

Eugenia dombeyana A. P. de Candolle, Prodr. 3:276. 1828.

Myrtus gudilla Colla, Mem. Reale Accad. Sci. Torino 37:66. (preprints May 1833) late 1834.

Eugenia stenophylla W. J. Hooker et Arnott, Bot. misc. 3:322. 1833.

Eugenia gudilla (Colla) Barnéoud, in Gay, Fl. Chil. 2:396. 1847.

Luma stenophylla (W. J. Hooker et Arnott) Gray, U.S. Expl. Exped., Phan. 540. 1854.

Eugenia stenophylla [var.] *α angustifolia* Hooker ex Berg, Linnæa 27:254. 1856.

Eugenia stenophylla [var.] *β latifolia* Hooker ex Berg, Linnæa 27:254. 1856.

Myrceugenia stenophylla (W. J. Hooker et Arnott) Berg, Linnæa 30:670. 1861.

Luma dombeyana (A. P. de Candolle) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:525. 1941.

Shrub up to 3 m high; hairs reddish brown to whitish, a mixture of simple and dibrachiate; twigs reddish when young, later brown or grey, densely to sparsely pubescent when young, soon glabrescent, the hairs spreading, mainly simple and asymmetrically dibrachiate. Leaves oblanceolate to linear, (1.5–)2–5 cm long, 0.2–1.5(–2) cm wide, (2.5–)3–15 times as long as wide, glabrous or with a few scattered appressed dibrachiate hairs below; apex acute, acuminate, obtuse, or rarely rounded; base acute or cuneate, normally tapering from above the middle of the leaf; petiole unchanneled or weakly channeled, sparsely pubescent to glabrous, 1–4(–5) mm long, 0.5–1 mm thick; midvein shallowly impressed for nearly entire length above, moderately prominent below; lateral veins indistinct or up to ca. 10 pairs of sharply ascending veins faintly visible; marginal veins equalling or less prominent than the laterals; blades coriaceous, dark grey green to reddish brown above, lighter grey green, yellow green or tan below when dry, normally strongly discolorous, the surfaces dull. Peduncles uniflorous or bearing a 3 (rarely more)-flowered dichasium, flattened, 0.4–3.5 cm long, 0.5–1 mm wide, densely to sparsely pubescent, solitary or in pairs (rarely triplets) in the leaf axils, the terminal flower of the dichasium usually without a stalk beyond the bracteoles; bracteoles of solitary flowers and lateral flowers lanceolate, 1.5–3 mm long, 0.5–1 mm wide, 2.5–4 times as long as wide, subcoriaceous, sparsely to densely pubescent without, sparsely pubescent to glabrous within, clasping the hypanthium, the bracteoles of the central flowers of the dichasium similar but larger, up to 15 mm long; calyx lobes ovate to oblong, 1.8–4 mm long, 1.5–3 mm wide, 1–1.7 times as long as wide, submembranous, sparsely pubescent distally to glabrous within, sparsely to moderately pubescent without, concave, becoming strongly reflexed after flowering; petals glabrous to sparsely pubescent, suborbicular, 2–4 mm in diam., white to tan when dry; hypanthium more or less obconic, contracted below the calyx lobes, 2–5 mm long, densely pubescent; disk sparsely to densely pubescent, 2–3 mm across, recessed in the center; stamens 100–200, 3–7 mm long; anthers 0.3–0.5 mm long when dry; style 6–10 mm long, sparsely pubescent; ovary 2–3-locular; ovules 4–8 per locule. Fruit

globose to pyriform, 7–10 mm long, yellow, slightly spongy, the walls thin, not noticeably glandular; seeds 2–8 in fruits seen, oblong, 3–5 mm long (Fig. 12E).

DISTRIBUTION (Fig. 13A).—A shrub growing along streams and rivers from Valparaíso to Malleco.

PHENOLOGY.—Flowering mainly in March and February; fruits probably mature mostly in September and October.

Myrceugenia lanceolata can be distinguished by its oblanceolate, strongly discolorous leaves, and dichasial inflorescence.

8.7. *Myrceugenia leptospermoides* (A. P. de Candolle) Kausel, Revisión de las Mirtáceas Chilenas 2. 1940; Revista Argent. Agron. 9: 52. 1942.

Eugenia leptospermoides A. P. de Candolle, Prodr. 3:266. 1828.
Eugenia leptospermoides [var.] α *microphylla* Berg, Linnaea 27:143. 1856.

?*Eugenia leptospermoides* [var.] β *latifolia* Berg, Linnaea 27: 143. 1856.

Eugenia leptospermoides [var.] γ *longifolia* Berg, Linnaea 27: 143. 1856.

Eugenia thymifolia R. A. Philippi ex Reiche, Anales Univ. Chile 98:719. 1897; Fl. Chile 2:303. 1898.

Shrub 0.5–2 m high; hairs reddish brown, a mixture of simple and dibrachiate; twigs grey to whitish grey, densely pubescent when young, the hairs persisting until the first bark falls. Leaves oblong to linear, 4–15 mm long, 1.5–3 mm wide, 2.7–7 times as long as wide, glabrous or with a few scattered hairs beneath; apex obtuse; base obtuse to acute; midvein slightly impressed or not at all above, moderately prominent below; lateral and marginal veins indistinct; blades subcoriaceous, dull grey green or brownish green above, lighter, often yellow green below. Peduncles uniflorous, slightly flattened, 2–8 mm long, 0.2–0.3 mm wide, densely pubescent, solitary (rarely in pairs) in the axils of leaves; bracteoles ovate to oblong-lanceolate, blunt, 0.4–1.5 mm long, 0.3–0.7 mm wide, 1.3–2.3 times as long as wide, sparsely pubescent to glabrous within and without, subcoriaceous, loosely clasping the hypanthium; calyx lobes ovate, oblong-ovate to suborbicular, 1–2 mm long, 1–1.5 mm wide, 0.8–1.4 times as long as wide, glabrous to very sparsely pubescent within and without, membranous to subcoriaceous, concave, usually tinged with

red; hypanthium densely pubescent; stamens 60–90, ca. 3–5 mm long; anthers 0.2–0.4 mm long when dry; petals suborbicular, 1.5–2.5 mm in diam.; style ca. 4–5 mm long, glabrous to very sparsely pubescent; ovary 2–3-locular; ovules 2–6 per locule. Fruit reddish purple, globose, 4–5 mm in diam.; seeds 1–2 in fruits seen, oblong, 2–3 mm long (Fig. 12B).

DISTRIBUTION (Fig. 15C).—A shrub of Concepción, Arauco, and Malleco apparently confined to humid or foggy habitats.

PHENOLOGY.—Flowering in February and March; fruits seem to mature about 1 yr later.

Myrceugenia leptospermoides can be distinguished by its linear to oblong leaves 1.5–3 mm wide and pubescent peduncles.

8.8 *Myrceugenia obtusa* (A. P. de Candolle) Berg, *Linnaea* 30:699. 1861.

Eugenia obtusa A. P. de Candolle, *Prodr.* 3:266. 1828.

Myrtus raran Colla, *Mem. Reale Accad. Sci. Torino* 37:66. (preprints May 1833) late 1834.

Eugenia raran (Colla) Barnéoud, in Gay, *Fl. Chil.* 2:388. 1847.

Luma obtusa (A. P. de Candolle) A. Gray, *U.S. Expl. Exped.*, Phan. 541. 1854.

Myrceugenia chilensis Berg, *Linnaea* 27:132. 1956.

Eugenia polyantha Philippi, *Linnaea* 28:639. 1857.

Myrceugenia obtusa [var.] α *raran* (Colla) Berg, *Linnaea* 30:699. 1861.

Myrceugenia obtusa [var.] β *berteroana* Berg, *Linnaea* 30:699. 1861.

Myrceugenia obtusa [var.] γ *polyantha* (Philippi) Berg, *Linnaea* 30:699. 1861.

Shrub or small tree 2–8 m high; hairs reddish brown, a mixture of simple and dibrachiate; twigs reddish brown when young, becoming greyish brown with age, densely pubescent when young, the hairs spreading, persisting until the first bark exfoliates. Leaves opposite to subopposite, glabrous or with a few scattered hairs, elliptic to ovate, 1–3 cm long, 0.6–2(–2.5) cm wide, 1–2.2 times as long as wide; apex bluntly acute, obtuse or rounded; base acute, obtuse to rounded (rarely slightly cordate); midvein not noticeably impressed above, moderately prominent to indistinct below; lateral veins indistinct or up to ca. 5 pairs faintly visible; marginal veins indistinct; blades coriaceous, often brittle even when alive, grey green to brown above, lighter grey green or brown below, the surfaces dull or lustrous, often wrinkled, with the appearance of shiny paper. Peduncles uniflorous, flattened, 2–15 mm long,

0.4–0.6 mm wide, moderately to densely pubescent, solitary in the axils of leaves; bracteoles leaflike, petiolate, linear, oblong, elliptic or spatulate, 2–6 mm long, 0.5–2.5 mm wide, 2–4.5 times as long as wide, subcoriaceous, glabrous to sparsely pubescent, not clasping the hypanthium; calyx lobes ovate to oblong, 2–4 mm long, 1.7–2.5 mm wide, 1–1.8 times as long as wide, submembranous, glabrous within, sparsely pubescent to glabrous without, concave; petals suborbicular, 3–4 mm long; hypanthium densely pubescent, 1–2 mm long, more or less obconic; disk 2–2.5 mm across, sparsely pubescent to glabrous; stamens 90–190, 4–8 mm long; anthers 0.2–0.4 mm long when dry; style 5–7 mm long, glabrous to sparsely pubescent; ovary 2–4-locular; ovules 5–9(–12) per locule. Fruit dark purple black, globose to elongate, 5–10 mm in diam.; seeds 3–4 in fruits seen, 4–5 mm in diam. (Fig. 12G).

DISTRIBUTION (Fig. 16A).—A shrub or small tree of coastal Coquimbo to the central valley of Cautín.

PHENOLOGY.—Flowering in December and January; fruits maturing from April to November.

Myrceugenia obtusa is easily distinguished by small obtuse, mainly elliptic leaves and leafy bracteoles.

8.9 *Myrceugenia ovata* (W. J. Hooker et Arnott) Berg, *Linnaea* 30:670. 1861.

Eugenia ovata W. J. Hooker et Arnott, *Bot. misc.* 3:319. 1833.

Shrub or small tree up to ca. 8 m high, with moderately rough, scaly bark when large; hairs whitish to reddish brown, a mixture of simple and dibrachiate; twigs densely pubescent when young, glabrescent with age, the young bark smooth, grey or light brown. Leaves glabrous to sparsely pubescent beneath, entirely glabrous to puberulent along the midvein above, ovate to elliptic, 0.3–4 cm long, 0.2–2 cm wide, 1.2–2.6 times as long as wide; apex acute, acuminate, obtuse, or rounded; base acute to truncate; petiole channeled, densely to sparsely pubescent, 1–5 mm long, 0.5–1 mm thick; midvein impressed for entire length or only proximally above, moderately prominent below; lateral veins indistinguishable or up to ca. 10 pairs faintly visible; marginal veins equalling laterals in prominence; blades grey green, reddish brown, or yellow green above, lighter below, coriaceous to submem-

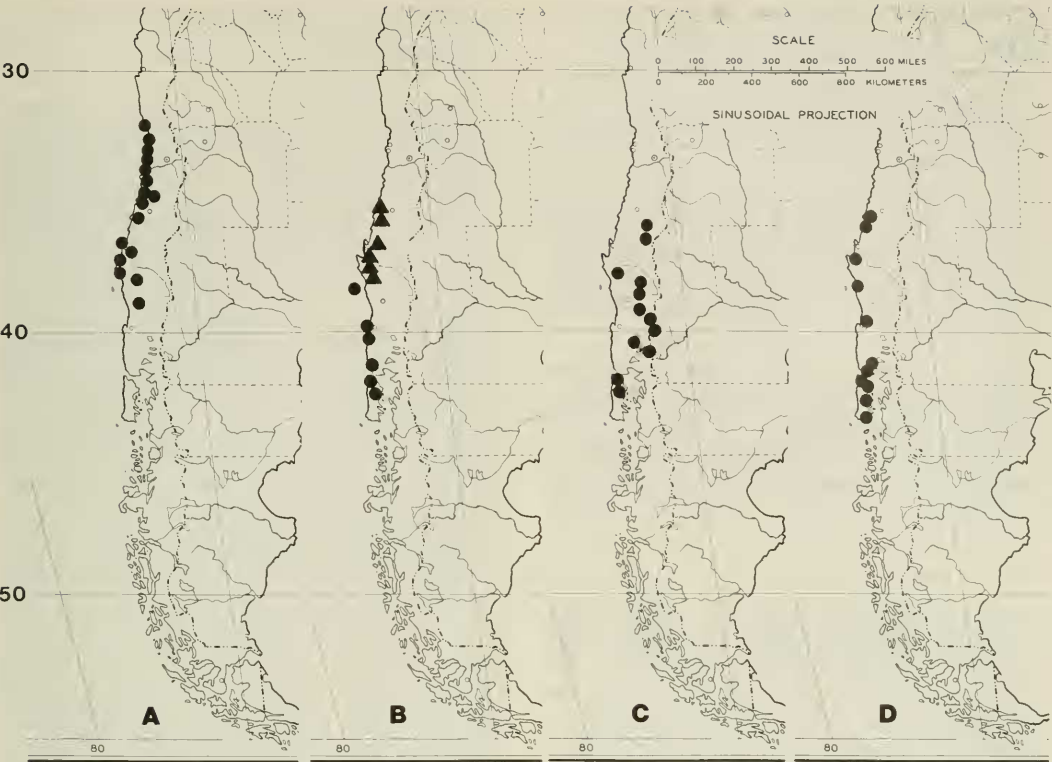


FIGURE 16. Distribution of *Myrceugenia obtusa* (A, circles), *M. ovata* var. *ovata* (B, circles), *M. pinifolia* (B, triangles), *M. ovata* var. *nannophylla* (C, circles), and *M. parvifolia* (D, circles).

branous, the upper surface dull or lustrous. Peduncles uniflorous, flattened, 0.2–1.5 cm long, 0.3–0.5 mm wide, densely pubescent, solitary in the axils of leaves; bracteoles ovate to lanceolate, 0.5–1.8 mm long, 0.3–1 mm wide, 1.2–3.8 times as long as wide, sparsely pubescent to glabrous within and without, subcoriaceous to membranous, clasping the hypanthium; calyx lobes triangular to ovate, 1–2.5(–3) mm long and wide, 0.8–1.4 times as long as wide, sparsely pubescent to glabrous within and without, subcoriaceous to membranous, concave; hypanthium densely pubescent, obconic, 1–2 mm long; disk ca. 1–2.5 mm across, sparsely pubescent to glabrous; stamens 50–130, 3–8 mm long; anthers 0.2–0.4 mm long; petals glabrous, suborbicular, 1.5–4 mm in diam.; ovary 2–4-locular; ovules 3–11 per locule. Fruit globose, ca. 4–7 mm in diam., yellowish to orange, few seeded, the seeds ca. 3–5 mm long.

There are four varieties of *Myrceugenia ovata*: two of southeastern Brazil and two of temperate western South America (Landrum 1981).

Myrceugenia ovata of western South America

is distinguished by ovate leaves, and persistent, small, ovate to lanceolate clasping bracteoles. Var. *ovata* has occasionally been confused with *Luma apiculata* and *Amomyrtus luma*. Both have deciduous bracteoles. *Amomyrtus* has pentamerous flowers, whereas in *Myrceugenia* they are tetramerous.

- KEY TO VARIETIES OF *MYRCEUGENIA OVATA* IN CHILE
- 1. Leaves ovate, mainly 1–2 cm long, often surpassing 2 cm, the apex acute to acuminate; along the coast and in the coastal mountains of Chile var. *ovata*
 - 1. Leaves ovate to elliptic, mainly under 1 cm long, rarely surpassing 1.5 cm long, the apex obtuse to rounded; mainly Andean var. *nannophylla*

8.9a. *Myrceugenia ovata* var. *ovata*

Eugenia ovata W. J. Hooker et Arnott, Bot. misc. 3:319, as to type, 1833.

Eugenia cuningii W. J. Hooker et Arnott, Bot. misc. 3:319. 1833.

Eugenia trichocarpa Philippi, Linnaea 28:688. 1858.

Luma ovata (W. J. Hooker et Arnott) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:524. 1941.

Luma cuningii (W. J. Hooker et Arnott) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:524. 1941.

Leaves mainly ovate, 0.6–4 cm long, 0.5–2 cm wide, ca. 1.2–2.2 times as long as wide; apex acute to acuminate. Peduncles ca. 3–15 mm long; calyx lobes 1.1–2.5(–3) mm long, 1.4–2.5(–3) mm wide; hypanthium 1–2 mm long; stamens 50–130; ovules 5–11 per locule (Fig. 12C).

DISTRIBUTION (Fig. 16B).—An understory tree in coastal forests from Arauco (Isla Mocha), and from Valdivia to Chiloé.

PHENOLOGY.—Flowering from December to February; fruiting period probably during the winter months.

8.9b. *Myrceugenia ovata* var. *nannophylla* (Burret) Landrum, Brittonia 32(3):374. 1980.

Luma nannophylla Burret, Repert. Spec. Nov. Regni Veg. 50: 50. 1941.

Myrceugenia montana Kausel, Revista Argent. Agron. 9:55. 1942.

Myrceugenia valientei Kausel, Revista Argent. Agron. 11:323. 1944.

Myrceugenia nannophylla (Burret) Kausel, Revista Argent. Agron. 18:233. 1951.

Leaves mainly ovate, elliptic toward the northern end of range, 3–16 mm long, 2–8 mm wide, 1.2–2.6 times as long as wide; apex obtuse to rounded. Peduncles ca. 2–15 mm long; calyx lobes 1–2.2 mm long, 1–2 mm wide; hypanthium 1–2 mm long; stamens 50–110; ovules 3–8 per locule (Fig. 12D).

DISTRIBUTION (Fig. 16C).—A shrub, often growing near lakes, from the Andes of Linares to Chiloé in Chile and in the vicinity of Lago Nahuel Huapi in Neuquén, Argentina. Sometimes associated with *Nothofagus antarctica* in what appear to be cold air pockets.

PHENOLOGY.—Flowering from February to April; fruits seem to mature about 12 mo later.

8.10. *Myrceugenia parvifolia* (A. P. de Candolle) Kausel, Revisión de las Mirtáceas Chilenas 2. 1940; Revista Argent. Agron. 9: 53. 1942.

Eugenia parvifolia A. P. de Candolle, Prodr. 3:266. 1828.

Luma baeckeoides Grisebach, Syst. Bemerk. 32. 1854; Abh. Königl. Ges. Wiss. Göttingen 6:120. 1856.

Shrub or small tree 1–5 m high; hairs whitish to reddish brown, a mixture of simple and dibrachiate; twigs light grey to reddish brown, densely pubescent when young, the hairs spreading, deciduous with the young twig bark. Leaves glabrous or with scattered symmetric dibrachiate hairs, narrowly elliptic, oblong or lanceolate, 1–2.6 cm long, 0.3–0.7 cm wide, (2.2–)2.7–4.8 times as long as wide; apex and base acute to obtuse; midvein impressed for entire length to not at all above, moderately prominent to indistinct below; lateral veins indistinct or up to 5 pairs faintly visible; marginal veins equalling laterals in prominence; blades subcoriaceous to submembranous, dull grey green, often tinged with reddish brown above, lighter grey green or yellow green below. Peduncles uniflorous, slightly flattened, 5–14 mm long, 0.3–0.4 mm wide, glabrous or with a few scattered hairs, solitary in the axils of leaves; bracteoles ovate to lanceolate, 0.5–1 mm long, 0.2–0.5 mm wide, 1.3–3.5 times as long as wide, subcoriaceous, sparsely pubescent to glabrous within and without, loosely clasping the hypanthium; calyx lobes ovate to oblong, 1.2–2.3 mm long, 1–2 mm wide, 1–1.7 times as long as wide, glabrous or with a few scattered hairs within and without, submembranous, concave; hypanthium obconic, 0.8–1.5 mm long, sparsely pubescent, the hairs whitish, appressed; disk 1–2 mm across, very sparsely pubescent to glabrous; stamens 60–100; anthers 0.2–0.3 mm long; ovary 2–3-locular; ovules 3–8 per locule. Fruit globose, ca. 7 mm in diam.; seeds few, oblong, 3–4 mm long (Fig. 12A).

DISTRIBUTION (Fig. 16D).—An understory shrub or tree from Arauco to Chiloé.

PHENOLOGY.—Flowering mainly in February and March; fruits probably maturing in October and November.

Myrceugenia parvifolia is distinguished by its relatively narrow, small leaves, and glabrous peduncles.

8.11. *Myrceugenia pinifolia* (F. Philippi) Kausel, Revisión de las Mirtáceas Chilenas 2. 1940; Revista Argent. Agron. 9:54. 1942.

Eugenia pinifolia F. Philippi, *Annales Univ. Chile* 84:758. 1893.

Myrceugenia stenophylla var. *pinifolia* (F. Philippi) Reiche, *Annales Univ. Chile* 98:713. 1897; *Fl. Chile* 2:297. 1898.

Shrub up to ca. 2 m high; hairs reddish brown to whitish, a mixture of simple and dibrachiate; twigs densely pubescent when young, glabrescent with age, the hairs usually spreading. Leaves narrowly elliptic to linear, 1–3 cm long, 0.2–0.8 cm wide, 3–12 times as long as wide, glabrous to very sparsely pubescent, the hairs appressed, dibrachiate; apex and base acute or obtuse; petiole channeled, densely pubescent, 0.5–3 mm long, 0.3–0.8 mm thick; midvein slightly impressed proximally to not at all above, moderately prominent to indistinct below; lateral and marginal veins indistinct; blades coriaceous to subcoriaceous, grey green, often dark above, light grey green to light yellow green below, usually strongly discoloured, the surfaces dull. Peduncles uniflorous, 5–10 mm long, 0.3–0.5 mm wide, densely pubescent, solitary in the axils of leaves; bracteoles ovate to lanceolate, (0.5–)0.7–1.8 mm long, 0.3–1 mm wide, 1.3–2.6 times as long as wide, subcoriaceous, glabrous or nearly so within, sparsely pubescent without, clasping the hypanthium; calyx lobes bluntly ovate to shortly oblong, 1–2.3 mm long, 1–2.5 mm wide, 0.8–1.3 times as long as wide, subcoriaceous, glabrous or nearly so within, sparsely pubescent without, concave; hypanthium obconic, 1.5–2.5 mm long, densely pubescent; disk sparsely pubescent to glabrous, 1.5–2.5 mm across; style glabrous, 6–7 mm long; stamens 100–140, 3–8 mm long; anthers 0.3–0.4 mm long when dry; petals glabrous, suborbicular, ca. 3 mm in diam.; ovary 2-locular; ovules 6–12 per locule. Fruit unknown (Fig. 12F).

DISTRIBUTION (Fig. 16B).—A shrub growing along streams and around lakes from the coastal cordillera westward, from Maule to Arauco.

PHENOLOGY.—Flowering in January and February; fruiting period probably during the winter months.

Myrceugenia pinifolia is distinguished by its small, narrow, discoloured leaves, and uniflorous, pubescent peduncles. It is very similar to *M. ovata* var. *nannophylla*. The most notable difference is in leaf shape (see Fig. 12D and F). *Myrceugenia pinifolia* is a coastal species, usually found below 200 m, whereas *M. ovata* var. *ovata* is a mainly Andean species growing above 500 m.

8.12. ***Myrceugenia planipes*** (W. J. Hooker et Arnott) Berg, *Bot. Zeitung (Berlin)* 16:250. 1858; *Linnaea* 30:670. 1861.

Eugenia planipes W. J. Hooker et Arnott, *Bot. misc.* 3:323. 1833.

Eugenia planipes [var.] *α genuina* Berg, *Linnaea* 27:162. 1856.

Eugenia planipes [var.] *β grandiflora* Berg, *Linnaea* 27:162. 1856.

Eugenia distoma Berg, *Linnaea* 27:155. 1856.

Myrcia planipes (W. J. Hooker et Arnott) Kiaerskou, *Enum. Myrt. bras.* 115. 1893.

Myrceugenia distoma (Berg) Kausel, *Revista Argent. Agron.* 9:238. 1942.

Small tree up to ca. 8 m high; hairs whitish, yellowish, or less often reddish brown, symmetrically dibrachiate, appressed; twigs sparsely to densely pubescent when young, glabrescent with age, the bark grey, often persisting as strips beneath the leaf bases. Leaves moderately to sparsely pubescent below when young, glabrescent with age, elliptic, 2.2–8 cm long, 1–3 cm wide, 2–3.4 times as long as wide; apex acuminate, less often acute; base cuneate to acuminate; petiole channeled, 2–6 mm long, 1–2 mm thick, densely to sparsely pubescent, becoming less so with age; midvein impressed for entire length or nearly so above, prominent below; lateral veins indistinguishable or up to ca. 30 pairs faintly visible; marginal veins equalling laterals in prominence; blades drying light to dark grey green or reddish brown above, lighter yellow green, grey green, or tan beneath, coriaceous. Peduncles strongly flattened, 0.7–3 cm long, ca. 1 mm wide, sparsely to moderately pubescent, solitary or up to 3(–4) in the axils of leaves or, less often, of bracts; bracteoles ovate to lanceolate, 1.9–3.1 mm long, 0.8–1.3(–1.7) mm wide, 1.4–3 times as long as wide, sparsely pubescent within and without, clasping the hypanthium or somewhat reflexed; calyx lobes broadly ovate, concave, 1.8–3 mm long, 2.5–4 mm wide, 0.5–0.8(–1.2) times as long as wide, coriaceous, sparsely pubescent to glabrous within and without; hypanthium hemispherical, densely pubescent, 1.5–4 mm long, usually prolonged 1–1.5 mm past the ovary; disk 2.5–4 mm across, sparsely pubescent to glabrous; style ca. 1 cm long, glabrous; stamens 120–220, 7–12 mm long; anthers 0.4–0.8 mm long when dry; petals suborbicular, 3–6 mm in diam.; ovary 3–4-locular; ovules 4–11(–13) per locule. Fruit globose, 0.8–1 cm in diam., purplish black; seeds few, ca. 6 mm in diam. (Fig. 12I).

DISTRIBUTION (Fig. 13C).—An understory tree,

usually growing below 700 m, from Arauco to Aisén in Chile and on the Quetrihué peninsula in Lago Nahuelhuapi, Neuquén, Argentina.

PHENOLOGY.—Flowering mainly in January and February; fruits maturing in November and December.

Myrceugenia planipes is distinguished by relatively large, elliptic leaves that are usually acuminate at base and apex. It is most frequently confused with *M. chrysocarpa*. They are compared directly in lead 17 of the key.

8.13. *Myrceugenia rufa* (Colla) Skottsberg ex Kausel, Lilloa 13:134. 1948 ("1947").

Myrtus rufa Colla, Mem. Reale Accad. Sci. Torino 37:66. (preprints May 1833) late 1834.

Eugenia ferruginea W. J. Hooker et Arnott, Bot. misc. 3:319. 1 Aug 1833.

Eugenia rufa (Colla) Barnéoud in Gay, Fl. Chil. 2:388. 1847.

Luma ferruginea (W. J. Hooker et Arnott) A. Gray, U.S. Expl. Exped., Phan. 15:542. 1854.

Myrceugenia ferruginea (W. J. Hooker et Arnott) Reiche, Anales Univ. Chile 98:710. 1897; Fl. Chile 2:294. 1898.

Luma rufa (Colla) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:524. 1941.

Shrub 1–2 m high; hairs reddish brown to whitish, symmetrically dibrachiate, appressed; twigs densely pubescent when young, the hairs persisting until the first bark falls, the original bark splitting in a reticulate fashion, whitish grey, the new inner bark at first reddish brown, becoming whitish grey. Leaves densely strigose-pubescent beneath, puberulent above, sometime glabrescent with age, broadly to narrowly elliptic, ovate or oblong, 0.5–1.8 cm long, 0.2–0.5 cm wide, 1.2–4.5 times as long as wide, the margin revolute; petiole densely pubescent, sometimes glabrescent with age, 1–2 mm long, not noticeably channeled; veins all indistinct above and below, or the midvein faintly visible; blades light bluish green to yellowish green, often lustrous above, reddish brown to whitish yellow below, stiffly coriaceous. Peduncles uniflorous, slightly flattened, about 0.5 mm wide, 1–4 mm long, densely pubescent, solitary or 2–3 in a row in the axils of leaves; bracteoles ovate to broadly oblong, 0.9–1.5 mm long, 0.7–1 mm wide, 1–2 times as long as wide, coriaceous, densely pubescent without, sparsely pubescent within, clasping the hypanthium; calyx lobes ovate to suborbicular, strongly concave, 1.2–2.6 mm long and wide, usually 0.8–1 times as long as wide, densely to

sparsely pubescent without, sparsely pubescent to glabrous within; hypanthium obconic, densely pubescent, ca. 2 mm long; disk 2–2.5 mm across, densely pubescent; style 5–6 mm long, sparsely pubescent; stamens 60–100, 3–6 mm long; anthers 0.4–0.6 mm long when dry; petals more or less orbicular, 2–3 mm in diam., very sparsely pubescent within and without; ovary 2–4-locular; ovules 5–13 per locule. Fruit 4–8 mm in diam., yellow to orange, pubescent; seeds usually destroyed by insects (Fig. 12M).

DISTRIBUTION (Fig. 15A).—A small dense shrub restricted to coastal habitats from central Coquimbo to just north of San Antonio.

PHENOLOGY.—Flowering mainly from August to October; fruits mature in February and March. Insects commonly decimate the seeds so that it is often difficult to find mature ones. There was a relatively good seed crop in 1988 after a very wet winter that may have affected the insect population.

Myrceugenia rufa is easily distinguished from other species by its small thick leaves that have revolute margins, and which show little or no venation.

8.14. *Myrceugenia schulzei* Johow, Estud. Fl. Juan Fernández 96. 1896.

Luma schulzei (Johow) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:526. 1941.

Tree up to 12 m high; hairs yellow to yellow brown, almost entirely symmetrically dibrachiate; twigs densely lanate when young, glabrescent with age, the young twig bark greyish to yellowish white, sometimes tinged with reddish brown, persisting as strips. Leaves elliptic, ovate, obovate, lanceolate, or oblanceolate, 1.5–5(–6) cm long, 0.5–3 cm wide, 1.4–2.8 times as long as wide, densely lanate below when young, densely lanate to glabrous above, glabrescent on both surfaces with age, the smaller, narrower leaves on flower bearing branches; apex acuminate, acute to rounded; base acuminate, cuneate, acute, or obtuse; petiole channeled, 1–4 mm long, 0.5–1.5 mm thick, densely lanate when young, sometimes glabrescent; midvein shallowly impressed proximally, to not at all impressed above, prominent below; lateral veins indistinct or up to about 10 pairs faintly visible; marginal veins about as prominent as laterals or less so; blades

coriaceous, grey green, yellow green, or tinged with reddish brown above, the same or somewhat lighter below. Peduncles uniflorous or bearing a 3 (rarely more)-flowered dichasium, flattened, 0.5–2 cm long, ca. 0.5 mm wide, densely lanate (rarely glabrous), solitary or up to 3 in a row in the axils of leaves; bracteoles ovate to lanceolate, 1–2 mm long, 0.8–1 mm wide, 1.2–2.3 times as long as wide, submembranous, densely to sparsely covered with hairs, rarely glabrous without, glabrous or nearly so within, clasping the hypanthium; calyx lobes ovate-oblong, 1–3 mm long, 1–2.2 mm wide, 0.8–1.5 times as long as wide, sparsely covered with hairs (rarely glabrous) without, sparsely covered with hairs to glabrous within, concave; petals glabrous or nearly so, suborbicular, 2–3.5 mm in diam.; hypanthium obconic, 1.5–2.5 mm long, densely lanate; disk 2–3 mm across, sparsely covered with hairs to glabrous; stamens 90–140, 4–7 mm long; anthers orbicular to oblong, 0.3–0.5 mm long; style 4–6 mm long, glabrous or nearly so; ovary 2–4-locular; ovules 6–12 per locule. Fruit unknown.

DISTRIBUTION (Fig. 15A).—A tree endemic to Masafuera of the Juan Fernández Islands.

PHENOLOGY.—Flowering from January to April; fruiting period unknown.

Myrceugenia schulzei is distinguished by its yellowish brown indumentum of curly symmetrically dibrachiate hairs, and dichasial inflorescence.

GENUS OF UNCERTAIN AFFINITY

9. *Luma* A. Gray, U.S. Expl. Exped., Phan. 535. t. 66. 1854.

Myrceugenella Kausel, Revista Argent. Agron. 9:42. 1942.

Shrubs or small trees up to ca. 10 m high, weakly to strongly glandular, variously puberulent to villous; hairs unicellular, simple. Leaves persistent, subcoriaceous to submembranous, mainly elliptic. Inflorescence uniflorous, or a dichasium of 3 (rarely more) flowers; flowers tetramerous, the calyx lobes ovate-triangular to ovate-orbicular, concave; bracteoles linear, membranous, caducous at or before anthesis; ovary bilocular; ovules ca. 6–14 per locule. Fruit a fleshy, somewhat spongy berry; seeds lenticular, 1–16 per fruit; embryo with the cotyledons

suborbicular, thinly planoconvex, slightly fleshy, unfused, the hypocotyl cylindrical, about as long as the cotyledons (Figs. 11B, 17C).

Luma is distinguished from other Chilean Myrtaceae by its membranous testa and unique embryo (Fig. 11B, 17C) with suborbicular, thinly planoconvex cotyledons of about the same length as the hypocotyl. In flower it can be distinguished by tetramerous flowers, bracteoles that are caducous at or before anthesis, and relatively small, elliptic to suborbicular leaves with acute to apiculate apices.

The name *Myrceugenella* has commonly been used for this genus since it was proposed by Kausel (1942). *Luma* has priority over *Myrceugenella* and the latter name is nomenclaturally superfluous because it is based on the same type species as *Luma* (McVaugh 1956; Landrum 1986).

KEY TO THE SPECIES OF *LUMA*

1. Inflorescence a solitary flower or a dichasium of 3 (rarely more) flowers; leaves usually elliptic or suborbicular, the apex typically abruptly acuminate-apiculate; blades without noticeable glands or with only scattered glands; bark of the trunk greyish to bright orangish brown; habitat often near water but usually in seasonally dry areas ... 9.1. *L. apiculata*
 1. Inflorescence a solitary flower; leaves usually lanceolate, ovate or elliptic, the apex usually acute or only slightly apiculate; blades usually strongly glandular; bark of the trunk greyish brown; habitat usually continually wet, stream beds, marshes, or swamps ... 9.2. *L. chequen*
- 9.1. *Luma apiculata* (A. P. de Candolle) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:523. 1941.

Eugenia apiculata A. P. de Candolle, Prodr. 3:276. 1828.

Eugenia gilliesii W. J. Hooker et Arnott, Bot. misc. 3:320. 1833.

Eugenia affinis Gillies ex W. J. Hooker et Arnott, Bot. misc. 3:321. 1833.

Eugenia hookeri Steudel, Nomencl. bot., ed. 2, 603. 1840.

Eugenia apiculata var. *Arnyan* J. D. Hooker, Fl. Antarct. 277. 1846.

Eugenia barneoudii Berg, Linnaea 27:263. 1856.

Eugenia spectabilis R. A. Philippi, Linnaea 28:639. 1857.

Eugenia modesta R. A. Philippi, Bot. Zeitung (Berlin) 15:400. 1857; Linnaea 28:688. 1858.

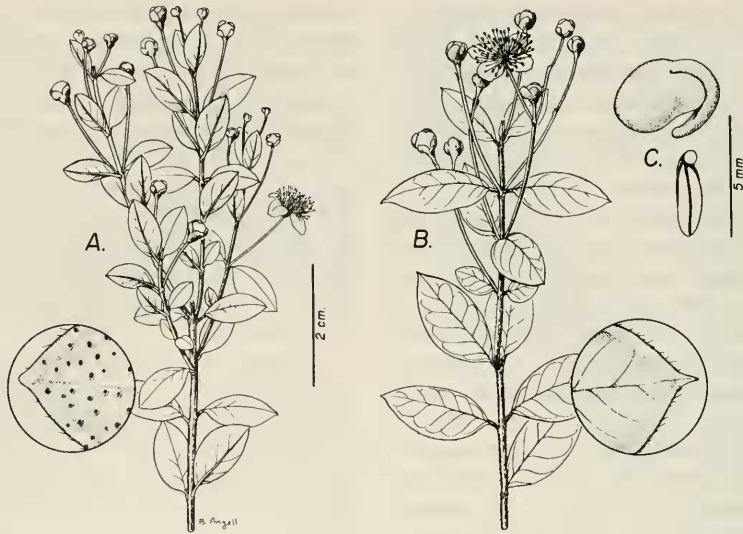


FIGURE 17. *Luma*. *Luma chequen* (Rusby 583 at NY): A, young branch with solitary flower inflorescences and an insert showing the upper leaf surface. *Luma apiculata*: B, young branch with solitary flower and dichasial inflorescences from which some flowers have fallen; and an insert showing the upper leaf surface (Landrum 4372 at NY). C, embryo (Landrum 4425 at NY). Drawn by Bobbi Angell.

Eugenia proba Berg. Linnaea 29:225. 1858.
Eugenia mucronata R. A. Philippi, Anales Univ. Chile 27: 327. 1865; Anales Univ. Chile 84:756. 1893.
Eugenia palenae Philippi, Anales Univ. Chile 84:756. 1893.
Eugenia cuspidata Philippi, Anales Univ. Chile 84:755. 1893.
Eugenia ebracteata F. Philippi, Anales Univ. Chile 84:758. 1893.
Myrceugenia apiculata (A. P. de Candolle) Niedenzu in Engler et Prantl, Nat. Pflanzenfam. 3(7):74. 1893.
Myrtus chequenilla O. Kuntze, Revis. gen. pl. 3(2):90. 1898.
Luma gilliesi (W. J. Hooker et Arnott) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:523. 1941.
Luma spectabilis (R. A. Philippi) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:523. 1941.
Luma hookeri (Steudel) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:526. 1941.
Myrceugenella apiculata (A. P. de Candolle) Kausel, Revista Argent. Agron. 9:47. 1942.
Myrceugenella apiculata var. *genuina* Kausel, Revista Argent. Agron. 9:48. 1942.
Myrceugenella apiculata var. *spectabilis* (R. A. Philippi) Kausel, Revista Argent. Agron. 9:49. 1942.
Myrceugenella apiculata var. *australis* Kausel, Revista Argent. Agron. 9:49. 1942.
Myrceugenella grandjotii Kausel, Revista Argent. Agron. 9:50. 1942.
Myrceugenella apiculata var. *nahuelhuapensis* Kausel, Revista Argent. Agron. 9:236. 1942.

puberulent to villous, becoming glabrescent with age. Leaves elliptic to suborbicular, less often ovate or lanceolate, 1–4.5 cm long, 0.5–3.5 cm wide, glabrous or villous to puberulent along the midvein and margins below; apex apiculate or abruptly acuminate, terminating in an apiculum ca. 1 mm long; base acute to rounded; petiole 1–2 mm long, 0.5–1 mm wide, puberulent to villous; midvein flat or slightly impressed proximally above, prominent below; lateral veins indistinct or up to ca. 8 pairs faintly visible; marginal veins equalling laterals in prominence; blades subcoriaceous, somewhat fleshy when fresh, drying reddish brown, greyish brown, or dark olive green, somewhat darker above than below, not noticeably glandular or with a few scattered glands, the lower surface usually somewhat striate, the margins usually revolute. Peduncles uniflorous or bearing a dichasium of 3 (rarely more) flowers, 5–30 cm long, ca. 0.5 mm wide, villous, puberulent, or glabrous; bracteoles membranous, deciduous before anthesis, narrowly lanceolate-triangular, ca. 1–1.5 mm long, sparsely puberulent; calyx lobes triangular-ovate to suborbicular, 2–3(–4) mm long and wide, about as wide as long, ciliate, otherwise glabrous or nearly so; petals suborbicular, ca. 3–5 mm long, ciliate, otherwise glabrous; hypanthium glabrous or nearly so, ca. 2–3 mm long, the sides concave;

Shrub or small tree up to ca. 10 m high, the trunk smooth, appearing somewhat twisted, the bark greyish to bright orangish brown; hairs whitish, 0.1–1 mm long, straight or curled; young twigs light reddish brown, densely to sparsely



FIGURE 18. Distribution of *Luma chequen* (A) and *L. apiculata* (B).

disk ca. 3 mm across, sometimes becoming a raised cone at the base of the style shortly after the petals and stamens fall; stamens 170–300, ca. 5–7 mm long; anthers ca. 0.4 mm long; style 6–7 mm long, normally glabrous; ovary 2-locular; ovules 6–14 per locule. Fruit subglobose, up to ca. 1 cm in diam., dark purple; seeds 1–16 per fruit, 3–6 mm long (Fig. 17B, C).

DISTRIBUTION (Fig. 18B).—A shrub or small tree of matorral and forests from Valparaíso to Aisén in Chile and in the forested regions of Río Negro, Neuquén, and Chubut in Argentina. Usually growing in localities with abundant humidity during at least part of the year, but not in soils that are continuously wet.

PHENOLOGY.—Flowering from December to

May but most abundantly from January to March. Fruiting mainly in March and April.

LOCAL NAMES AND USES.—Arrayán, palo colorado, temu, temo, collimamol, collimamul (Muñoz 1966). Used for handles of tools and domestic utensils (Rodríguez et al. 1983). I have seen the attractive orangish brown trunks of small trees used in woven fences in Chiloé. This species is cultivated in California and England.

Luma apiculata is perhaps the most common and widespread species of Myrtaceae in temperate western South America. In most regions the bark of the trunk is various shades of bright orangish brown, with white spots where bark has recently exfoliated. It is most likely to be con-

fused with *L. chequen* (for distinguishing characters see key), continental species of *Myrceugenia*, which have persistent bracteoles (not deciduous as they are in *Luma*), or *Blepharocalyx cruckshanksii*, which normally has leaves with emarginate apices (not apiculate or abruptly acuminate as in *L. apiculata*).

9.2. ***Luma chequen* (Molina) A. Gray, U.S. Expl. Exped., Phan. 536. 1854. 'Cheken.'**

Myrtus folio subrotundo vulgo Cheken, Feuillée, J. obs. 1725.
Eugenia chequen Molina, Sag. stor. nat. Chili, ed. 2, 148, 289. 1810.

Myrtus chequen (Molina) Sprengel, Syst. veg. 2:485. 1825. 'Cheken.'

Eugenia gayana Barnéoud, in Gay, Fl. Chil. 2:390. 1847.

Myrtus uliginosa Miquel, Linnaea 25:652. 1852.

Myrtus uliginosa forma *major* Miquel, Linnaea 25:652. 1852.

Myrtus gayana (Barnéoud) Berg, Linnaea 27:399. 1856.

Eugenia bella Philippi, Linnaea 28:641. 1858.

Eugenia pulchra Berg, Linnaea 29:224. 1858.

Eugenia myrtomimeta Diels, Bot. Jahrb. Syst. 37:598. 1906.

Luma gayana (Barnéoud) Burret, Notizbl. Bot. Gart. Berlin-Dahlem 15:523. 1941.

Myrceugenella chequen (Molina) Kausel, Revista Argent. Agron. 9:43. 1942.

Myrceugenella gayana (Barnéoud) Kausel, Revista Argent. Agron. 9:46. 1942.

Myrceugenella langerfeldtii Kausel, Revista Argent. Agron. 11: 324. 1944.

Myrceugenella chequen var. *myrtomimeta* (Diels) Kausel, Lilloa 33:104. 1972. "1971."

Shrub or small tree up to ca. 9 m high, the bark greyish brown; hairs whitish, 0.1–0.5 mm long; young twigs glabrous to densely puberulent, usually densely glandular, yellowish brown or light reddish brown, becoming brownish grey with age. Leaves elliptic, ovate, or lanceolate, rarely suborbicular, 0.5–2.5(–4) cm long, 0.4–1.5(–1.8) cm wide, 1.3–3 times as long as wide, glabrous or puberulent along the midvein and margins below; apex acute or scarcely acuminate, with or without an apiculum ca. 0.5 mm long; base acute to rounded; petiole 0.5–2 mm long, 0.5–1 mm wide, densely puberulent to glabrous; midvein flat or only slightly impressed above, prominent below; lateral veins indistinct or a few pairs faintly visible; marginal veins equalling laterals in prominence; blades submembranous to subcoriaceous, drying greyish green, somewhat darker above than below, normally strongly glandular, the margins revolute or not. Peduncle uniflorous, 0.5–2.5 cm long, ca. 0.5 mm wide, glabrous to sparsely puberulent; bracteoles linear, 1–2 mm

long, 0.2–0.3 mm wide, puberulent, normally deciduous before anthesis; calyx lobes concave, ovate-orbicular, 1.8–3.2 cm long, 2–3 cm wide, ca. 1–1.5 times as long as wide, ciliate, glandular; petals suborbicular, ca. 4–7 mm long, ciliate or glabrous; hypanthium glabrous to sparsely puberulent, glandular, funnel-shaped, 2–3 mm long, the sides concave; disk ca. 2–3 mm across, raised only slightly in the center after the petals and stamens fall; stamens ca. 90–230, ca. 3–7 mm long; anthers ca. 3–5 mm long; style ca. 7 mm long, normally glabrous; ovary 2-locular; ovules 6–11 per locule. Fruit subglobose, 0.6–1 cm in diam., dark purple; seeds 1–9 per fruit, 3–5 mm long (Fig. 17A).

DISTRIBUTION (Fig. 18A).—A small tree or shrub in Chile from Coquimbo to Llanquihue. Typically growing in habitats that are continually wet such as stream beds, marshes, and the edges of lakes, often in association with *Juncus*.

PHENOLOGY.—Flowering from November to April but mainly from December to March. Fruits mainly maturing from February to April.

LOCAL NAMES AND USES.—Chequén, arrayán blanco, arrayán (Muñoz 1966). *Luma chequen* is reported to have various medicinal uses (Muñoz et al. 1981) and was exported by Park Davis and Co. in the late 19th century (Rusby 1935).

Luma chequen is most likely to be confused with *L. apiculata* (see key for distinguishing characters) or some continental species of *Myrceugenia*, which all have persistent bracteoles (not deciduous as they are in *Luma*).

In the southern part of its range *Luma chequen* is small-leaved and has traditionally been given a different name (*Eugenia gayana*, or its equivalent in *Myrtus*, *Luma*, or *Myrceugenella*).

ACKNOWLEDGMENTS

I began work on this paper at the California Academy of Sciences and finished it at Arizona State University, but my studies of Chilean Myrtaceae date back to when I was a member of Peace Corps in Chile from 1969 to 1973, working in the Escuela de Ingeniería Forestal of the Universidad de Chile in Santiago. Since then my studies of Myrtaceae have continued at the University of Michigan (as a graduate student), the New York Botanical Garden (as B. A. Krukoff Research Associate), the California Academy of Sciences (as Tilton Fellow), and Arizona State

University (as Herbarium Curator). Colleagues at these institutions have been very helpful. Special thanks go to Rogers McVaugh, my major professor at the University of Michigan, and my wife Sonia, who has helped me in numerous ways in my research. The following persons have kindly aided me with arrangements for accommodations and transportation for field studies: Sr. Claudio Donoso, Dr. Carlos Ramírez, and Dr. Anton Huber, Universidad Austral, Valdivia; Sr. Clodomiro Marticorena, Universidad de Concepción; Sra. Mélica Muñoz, Museo de Historia Natural, Santiago; Sr. Jurgen Rottmann, Corporación Nacional Forestal, Santiago; Sra. Raquel Carrasco de Cubillos, Santiago; Sr. Alejandro Suanes, Concepción; and Sr. Francisco Chávez, Valdivia.

The following institutions allowed me to study their specimens of Chilean Myrtaceae as a visitor or by sending loans: A, ASU, CAS, CONC, CTES, DS, E, E-GL, EIF, F, G, GH, H, HBR, K, LE, LP, M, MBM, MICH, MO, MVM, NY, OS, SGO, SI, UC, US, VALD, and W.

Fieldwork and visits to South American herbaria were made possible through National Science Foundation grants DEB-7621543 and DEB-8111063 and a Research Incentive Award from Arizona State University.

I am very grateful to Dr. Rudolph Schmid, Sr. Clodomiro Marticorena, Sr. Claudio Donoso, and three anonymous reviewers who all offered many helpful suggestions as to how this paper could be improved.

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APPENDIX A

A list of specimens studied by the author while preparing this paper is available upon request. It is organized by collector and number and each collection is identified as to taxon. This list has been deposited in the libraries at the following herbaria: ASU, CAS, CONC, CTES, F, GH, H, LIL, LP, MICH, MO, NY, OS, SGO, UC, and US.